HOBART®
WELDING PRODUCTS

OM-492 190 603J
August 2000

Processes

MIG (GMAW) and Pulsed MIG (GMAW-P) Welding

Flux Cored (FCAW) Welding

Stick (SMAW) Welding

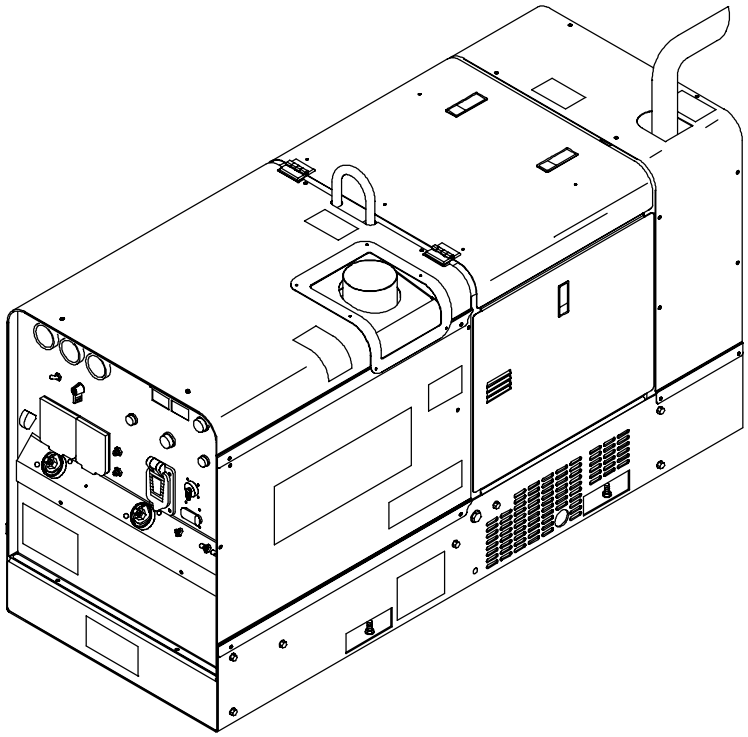
TIG (GTAW) Welding

Air Carbon Arc (CAC-A) Cutting and Gouging

Description

Engine Driven Welding Generator

Contractor 3025

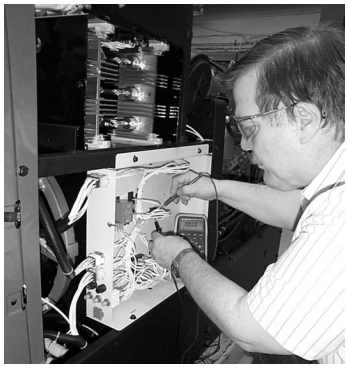


OWNER'S MANUAL

Visit our website at
www.HobartWelders.com

From Hobart to You

Thank you and *congratulations* on choosing Hobart. Now you can get the job done and get it done right. We know you don't have time to do it any other way.



This Owner's Manual is designed to help you get the most out of your Hobart products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Hobart you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Hobart is registered to the ISO 9001 Quality System Standard.

Hobart Welders manufactures a full line of welders and welding related equipment. For information on other quality Hobart products, contact your local Hobart distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-877-Hobart1.**

Hobart offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.

HOBART®
WELDING PRODUCTS

⚠ WARNING

This product, when used for welding or cutting, produces fumes or gases which contain chemicals known to the State of California to cause birth defects and, in some cases, cancer. (California Health & Safety Code Section 25249.5 et seq.)

⚠ WARNING

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

The following terms are used interchangeably throughout this manual:
MIG = GMAW, Wire Welding
TIG = GTAW
Stick = SMAW

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12-1. Symbol Usage

Means Warning! Watch Out! There are possible hazards with this procedure! The possible hazards are shown in the adjoining symbols.

▲ **Marks a special safety message.**

☞ *Means "Note"; not safety related.*

This group of symbols means Warning! Watch Out! possible ELECTRIC SHOCK, MOVING PARTS, and HOT PARTS hazards. Consult symbols and related instructions below for necessary actions to avoid the hazards.

12-2. Arc Welding Hazards

▲ **The symbols shown below are used throughout this manual to call attention to and identify possible hazards. When you see the symbol, watch out, and follow the related instructions to avoid the hazard. The safety information given below is only a summary of the more complete safety information found in the Safety Standards listed in Section 12-5. Read and follow all Safety Standards.**

▲ **Only qualified persons should install, operate, maintain, and repair this unit.**

▲ **During operation, keep everybody, especially children, away.**

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

- Do not touch live electrical parts.
- Wear dry, hole-free insulating gloves and body protection.
- Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
- Do not use AC output in damp areas, if movement is confined, or if there is a danger of falling.
- Use AC output ONLY if required for the welding process.
- If AC output is required, use remote output control if present on unit.
- Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
- Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
- Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
- When making input connections, attach proper grounding conductor first – double-check connections.
- Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
- Turn off all equipment when not in use.
- Do not use worn, damaged, undersized, or poorly spliced cables.
- Do not drape cables over your body.
- If earth grounding of the workpiece is required, ground it directly with a separate cable.
- Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
- Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
- Wear a safety harness if working above floor level.
- Keep all panels and covers securely in place.
- Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.
- Insulate work clamp when not connected to workpiece to prevent contact with any metal object.
- Do not connect more than one electrode or work cable to any single weld output terminal.

SIGNIFICANT DC VOLTAGE exists after stopping engine on inverters.

- Stop engine on inverter and discharge input capacitors according to instructions in Maintenance Section before touching any parts.

ARC RAYS can burn eyes and skin.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Sparks fly off from the weld.

- Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes from arc rays and sparks when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
- Wear approved safety glasses with side shields under your helmet.
- Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
- Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.

FUMES AND GASES can be hazardous.

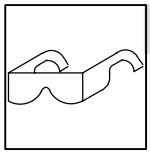
Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

- Keep your head out of the fumes. Do not breathe the fumes.
- If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
- If ventilation is poor, use an approved air-supplied respirator.
- Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instructions for metals, consumables, coatings, cleaners, and degreasers.
- Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watch-person nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
- Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
- Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.

WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

- Protect yourself and others from flying sparks and hot metal.
- Do not weld where flying sparks can strike flammable material.
- Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
- Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
- Watch for fire, and keep a fire extinguisher nearby.
- Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
- Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
- Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
- Do not use welder to thaw frozen pipes.
- Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
- Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
- Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.



FLYING METAL can injure eyes.

- Welding, chipping, wire brushing, and grinding cause sparks and flying metal. As welds cool, they can throw off slag.
- Wear approved safety glasses with side shields even under your welding helmet.

BUILDUP OF GAS can injure or kill.

- Shut off shielding gas supply when not in use.
- Always ventilate confined spaces or use approved air-supplied respirator.

HOT PARTS can cause severe burns.

- Allow cooling period before maintaining.
- Wear protective gloves and clothing when working on a hot engine.
- Do not touch hot engine parts or just-welded parts bare-handed.

NOISE can damage hearing.

Noise from some processes or equipment can damage hearing.

- Wear approved ear protection if noise level is high.

MAGNETIC FIELDS can affect pacemakers.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

- Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
- Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
- Keep cylinders away from any welding or other electrical circuits.
- Never drape a welding torch over a gas cylinder.
- Never allow a welding electrode to touch any cylinder.
- Never weld on a pressurized cylinder – explosion will result.
- Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
- Turn face away from valve outlet when opening cylinder valve.
- Keep protective cap in place over valve except when cylinder is in use or connected for use.
- Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

12-3. Engine Hazards

FUEL can cause fire or explosion.

- Stop engine and let it cool off before checking or adding fuel.
- Do not add fuel while smoking or if unit is near any sparks or open flames.
- Do not overfill tank – allow room for fuel to expand.
- Do not spill fuel. If fuel is spilled, clean up before starting engine.
- Dispose of rags in a fireproof container.

STEAM AND HOT COOLANT can burn.

- If possible, check coolant level when engine is cold to avoid scalding.
- Always check coolant level at overflow tank, if present on unit, instead of radiator (unless told otherwise in maintenance section or engine manual).
- If the engine is warm, checking is needed, and there is no overflow tank, follow the next two statements.
- Wear safety glasses and gloves and put a rag over radiator cap.
- Turn cap slightly and let pressure escape slowly before completely removing cap.

MOVING PARTS can cause injury.

- Keep away from fans, belts, and rotors.
- Keep all doors, panels, covers, and guards closed and securely in place.
- Stop engine before installing or connecting unit.
- Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
- To prevent accidental starting during servicing, disconnect negative (–) battery cable from battery.
- Keep hands, hair, loose clothing, and tools away from moving parts.
- Reinstall panels or guards and close doors when servicing is finished and before starting engine.
- Before working on generator, remove spark plugs or injectors to keep engine from kicking back or starting.
- Block flywheel so that it will not turn while working on generator components.

BATTERY EXPLOSION can BLIND.

- Always wear a face shield, rubber gloves, and protective clothing when working on a battery.
- Stop engine before disconnecting or connecting battery cables or servicing battery.
- Do not allow tools to cause sparks when working on a battery.
- Do not use welder to charge batteries or jump start vehicles.
- Observe correct polarity (+ and –) on batteries.
- Disconnect negative (–) cable first and connect it last.

BATTERY ACID can BURN SKIN and EYES.

- Do not tip battery.
- Replace damaged battery.
- Flush eyes and skin immediately with water.

ENGINE EXHAUST GASES can kill.

- Use equipment outside in open, well-ventilated areas.
- If used in a closed area, vent engine exhaust outside and away from any building air intakes.

ENGINE HEAT can cause fire.

- Do not locate unit on, over, or near combustible surfaces or flammables.
- Keep exhaust and exhaust pipes way from flammables.

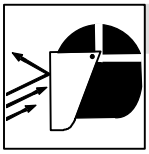
EXHAUST SPARKS can cause fire.

- Do not let engine exhaust sparks cause fire.
- Use approved engine exhaust spark arrestor in required areas – see applicable codes.

12-4. Additional Symbols For Installation, Operation, And Maintenance

FALLING UNIT can cause injury.

- Use lifting eye to lift unit only, NOT running gear, gas cylinders, trailer, or any other accessories.
- Use equipment of adequate capacity to lift and support unit.
- If using lift forks to move unit, be sure forks are long enough to extend beyond opposite side of unit.

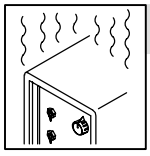


FLYING SPARKS can cause injury.

- Wear a face shield to protect eyes and face.
- Shape tungsten electrode only on grinder with proper guards in a safe location wearing proper face, hand, and body protection.
- Sparks can cause fires — keep flammables away.

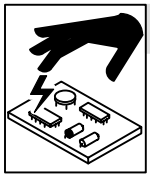
OVERHEATING can damage motors.

- Turn off or unplug equipment before starting or stopping engine.
- Do not let low voltage and frequency caused by low engine speed damage electric motors.
- Do not connect 50 or 60 Hertz motors to the 100 Hertz receptacle where applicable.



OVERUSE can cause OVERHEATING.

- Allow cooling period; follow rated duty cycle.
- Reduce current or reduce duty cycle before starting to weld again.
- Do not block or filter airflow to unit.

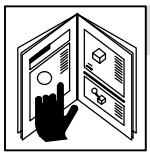


STATIC (ESD) can damage PC boards.

- Put on grounded wrist strap BEFORE handling boards or parts.
- Use proper static-proof bags and boxes to store, move, or ship PC boards.

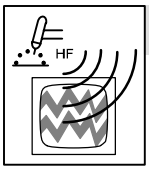
TILTING OF TRAILER can cause injury.

- Use tongue jack or blocks to support weight.
- Properly install welding generator onto trailer according to instructions supplied with trailer.



READ INSTRUCTIONS.

- Use only genuine MILLER replacement parts.
- Perform engine maintenance and service according to this manual and the engine manual.



H.F. RADIATION can cause interference.

- High-frequency (H.F.) can interfere with radio navigation, safety services, computers, and communications equipment.
- Have only qualified persons familiar with electronic equipment perform this installation.
- The user is responsible for having a qualified electrician promptly correct any interference problem resulting from the installation.
- If notified by the FCC about interference, stop using the equipment at once.
- Have the installation regularly checked and maintained.
- Keep high-frequency source doors and panels tightly shut, keep spark gaps at correct setting, and use grounding and shielding to minimize the possibility of interference.

ARC WELDING can cause interference.

- Electromagnetic energy can interfere with sensitive electronic equipment such as computers and computer-driven equipment such as robots.
- Be sure all equipment in the welding area is electromagnetically compatible.
- To reduce possible interference, keep weld cables as short as possible, close together, and down low, such as on the floor.
- Locate welding operation 100 meters from any sensitive electronic equipment.
- Be sure this welding machine is installed and grounded according to this manual.
- If interference still occurs, the user must take extra measures such as moving the welding machine, using shielded cables, using line filters, or shielding the work area.

12-5. Principal Safety Standards

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

12-6. EMF Information

Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields

Welding current, as it flows through welding cables, will cause electromagnetic fields. There has been and still is some concern about such fields. However, after examining more than 500 studies spanning 17 years of research, a special blue ribbon committee of the National Research Council concluded that: “The body of evidence, in the committee’s judgment, has not demonstrated that exposure to power-frequency electric and magnetic fields is a human-health hazard.” However, studies are still going forth and evidence continues to be examined. Until the final conclusions of the research are reached, you may wish to minimize your exposure to electromagnetic fields when welding or cutting.

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around your body.
4. Keep welding power source and cables as far away from operator as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

Pacemaker wearers consult your doctor first. If cleared by your doctor, then following the above procedures is recommended.

SECTION 1 – CONSIGNES DE SÉCURITÉ – LIRE AVANT UTILISATION

1-1. Signification des symboles

Signifie Mise en garde ! Soyez vigilant ! Cette procédure présente des risques de danger ! Ceux-ci sont identifiés par des symboles adjacents aux directives.

▲ **Identifie un message de sécurité particulier.**

☞ *Signifie NOTA ; n'est pas relatif à la sécurité.*

Ce groupe de symboles signifie Mise en garde ! Soyez vigilant ! Il y a des risques de danger reliés aux CHOCS ÉLECTRIQUES, aux PIÈCES EN MOUVEMENT et aux PIÈCES CHAUDES. Reportez-vous aux symboles et aux directives ci-dessous afin de connaître les mesures à prendre pour éviter tout danger.

1-2. Dangers relatifs au soudage à l'arc

▲ **Les symboles présentés ci-après sont utilisés tout au long du présent manuel pour attirer votre attention et identifier les risques de danger. Lorsque vous voyez un symbole, soyez vigilant et suivez les directives mentionnées afin d'éviter tout danger. Les consignes de sécurité présentées ci-après ne font que résumer l'information contenue dans les normes de sécurité énumérées à la section 1-5. Veuillez lire et respecter toutes ces normes de sécurité.**

▲ **L'installation, l'utilisation, l'entretien et les réparations ne doivent être confiés qu'à des personnes qualifiées.**

▲ **Au cours de l'utilisation, tenir toute personne à l'écart et plus particulièrement les enfants.**

UN CHOC ÉLECTRIQUE peut tuer.

Un simple contact avec des pièces électriques peut provoquer une électrocution ou des blessures graves. L'électrode et le circuit de soudage sont sous tension dès que l'appareil est sur ON. Le circuit d'entrée et les circuits internes de l'appareil sont également sous tension à ce moment-là. En soudage semi-automatique ou automatique, le fil, le dévidoir, le logement des galets d'entraînement et les pièces métalliques en contact avec le fil de soudage sont sous tension. Des matériels mal installés ou mal mis à la terre présentent un danger.

- Ne jamais toucher les pièces électriques sous tension.
- Porter des gants et des vêtements de protection secs ne comportant pas de trous.
- S'isoler de la pièce et de la terre au moyen de tapis ou d'autres moyens isolants suffisamment grands pour empêcher le contact physique éventuel avec la pièce ou la terre.
- Ne pas se servir de source électrique àcourant électrique dans les zones humides, dans les endroits confinés ou là où on risque de tomber.
- Se servir d'une source électrique àcourant électrique UNIQUEMENT si le procédé de soudage le demande.
- Si l'utilisation d'une source électrique àcourant électrique s'avère nécessaire, se servir de la fonction de télécommande si l'appareil en est équipé.
- Couper l'alimentation ou arrêter le moteur avant de procéder à l'installation, à la réparation ou à l'entretien de l'appareil. Déverrouiller l'alimentation selon la norme OSHA 29 CFR 1910.147 (voir normes de sécurité).
- Installer et mettre à la terre correctement cet appareil conformément à son manuel d'utilisation et aux codes nationaux, provinciaux et municipaux.
- Toujours vérifier la terre du cordon d'alimentation – Vérifier et s'assurer que le fil de terre du cordon d'alimentation est bien raccordé à la borne de terre du sectionneur ou que la fiche du cordon est raccordée à une prise correctement mise à la terre.
- En effectuant les raccordements d'entrée fixer d'abord le conducteur de mise à la terre approprié et contre-vérifier les connexions.
- Vérifier fréquemment le cordon d'alimentation pour voir s'il n'est pas endommagé ou dénudé – remplacer le cordon immédiatement s'il est endommagé – un câble dénudé peut provoquer une électrocution.
- Mettre l'appareil hors tension quand on ne l'utilise pas.
- Ne pas utiliser des câbles usés, endommagés, de grosseur insuffisante ou mal épissés.
- Ne pas enrouler les câbles autour du corps.
- Si la pièce soudée doit être mise à la terre, le faire directement avec un câble distinct – ne pas utiliser le connecteur de pièce ou le câble de retour.
- Ne pas toucher l'électrode quand on est en contact avec la pièce, la terre ou une électrode provenant d'une autre machine.
- N'utiliser qu'un matériel en bon état. Réparer ou remplacer sur-le-champ les pièces endommagées. Entretenir l'appareil conformément à ce manuel.
- Porter un harnais de sécurité quand on travaille en hauteur.
- Maintenir solidement en place tous les panneaux et capots.
- Fixer le câble de retour de façon à obtenir un bon contact métal-métal avec la pièce à souder ou la table de travail, le plus près possible de la soudure.
- Isoler la pince de masse quand pas mis à la pièce pour éviter le contact avec tout objet métallique.

Une tension DC importante subsiste à l'intérieur des onduleurs après avoir coupé l'alimentation.

- Couper l'alimentation du poste et décharger les condensateurs d'entrée comme indiqué dans la Section Maintenance avant de toucher des composants.

LES RAYONS DE L'ARC peuvent provoquer des brûlures dans les yeux et sur la peau.

Le rayonnement de l'arc du procédé de soudage génère des rayons visibles et invisibles intenses (ultraviolets et infrarouges) susceptibles de provoquer des brûlures dans les yeux et sur la peau. Des étincelles sont projetées pendant le soudage.

- Porter un casque de soudage muni d'un écran de filtre approprié pour protéger votre visage et vos yeux pendant le soudage ou pour regarder (voir ANSI Z49.1 et Z87.1 énuméré dans les normes de sécurité).
- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.
- Utiliser des écrans ou des barrières pour protéger des tiers de l'éclair et de l'éblouissement; demander aux autres personnes de ne pas regarder l'arc.
- Porter des vêtements de protection constitué dans une matière durable, résistant au feu (laine ou cuir) et une protection des pieds.

LES FUMÉES ET LES GAZ peuvent être dangereux.

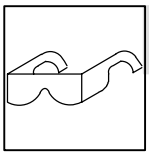
Le soudage génère des fumées et des gaz. Leur inhalation peut être dangereux pour votre santé.

- Eloigner votre tête des fumées. Ne pas respirer les fumées.
- À l'interieur, ventiler la zone et/ou utiliser un échappement au niveau de l'arc pour l'évacuation des fumées et des gaz de soudage.
- Si la ventilation est insuffisante, utiliser un respirateur à alimentation d'air homologué.
- Lire les spécifications de sécurité des matériaux (MSDSs) et les instructions du fabricant concernant les métaux, les consommables, les revêtements, les nettoyants et les dégraisseurs.
- Travailler dans un espace fermé seulement s'il est bien ventilé ou en portant un respirateur à alimentation d'air. Demander toujours à un surveillant dûment formé de se tenir à proximité. Des fumées et des gaz de soudage peuvent déplacer l'air et abaisser le niveau d'oxygène provoquant des blessures ou des accidents mortels. S'assurer que l'air de respiration ne présente aucun danger.
- Ne pas souder dans des endroits situés à proximité d'opérations de dégraissage, de nettoyage ou de pulvérisation. La chaleur et les rayons de l'arc peuvent réagir en présence de vapeurs et former des gaz hautement toxiques et irritants.
- Ne pas souder des métaux munis d'un revêtement, tels que l'acier galvanisé, plaqué en plomb ou au cadmium à moins que le revêtement n'ait été enlevé dans la zone de soudure, que l'endroit soit bien ventilé, et si nécessaire, en portant un respirateur à alimentation d'air. Les revêtements et tous les métaux renfermant ces éléments peuvent dégager des fumées toxiques en cas de soudage.

LE SOUDAGE peut provoquer un incendie ou une explosion.

Le soudage effectué sur des conteneurs fermés tels que des réservoirs, tambours ou des conduites peut provoquer leur éclatement. Des étincelles peuvent être projetées de l'arc de soudure. La projection d'étincelles, des pièces chaudes et des équipements chauds peut provoquer des incendies et des brûlures. Le contact accidentel de l'électrode avec des objets métalliques peut provoquer des étincelles, une explosion, un surchauffement ou un incendie. Avant de commencer le soudage, vérifier et s'assurer que l'endroit ne présente pas de danger.

- Se protéger et d'autres personnes de la projection d'étincelles et de métal chaud.
- Ne pas souder dans un endroit là où des étincelles peuvent tomber sur des substances inflammables.
- Déplacer toutes les substances inflammables à une distance de 10,7 m de l'arc de soudage. En cas d'impossibilité les recouvrir soigneusement avec des protections homologués.
- Des étincelles et des matériaux chauds du soudage peuvent facilement passer dans d'autres zones en traversant de petites fissures et des ouvertures.
- Surveiller tout déclenchement d'incendie et tenir un extincteur à proximité.
- Le soudage effectué sur un plafond, plancher, paroi ou séparation peut déclencher un incendie de l'autre côté.
- Ne pas effectuer le soudage sur des conteneurs fermés tels que des réservoirs, tambours, ou conduites, à moins qu'ils n'aient été préparés correctement conformément à AWS F4.1 (voir les normes de sécurité).
- Brancher le câble sur la pièce le plus près possible de la zone de soudage pour éviter le transport du courant sur une longue distance par des chemins inconnus éventuels en provoquant des risques d'électrocution et d'incendie.
- Ne pas utiliser le poste de soudage pour dégeler des conduites gelées.
- En cas de non utilisation, enlever la baguette d'électrode du porte-électrode ou couper le fil à la pointe de contact.
- Porter des vêtements de protection dépourvus d'huile tels que des gants en cuir, une chemise en matériau lourd, des pantalons sans revers, des chaussures hautes et un couvre chef.
- Avant de souder, retirer toute substance combustible de vos poches telles qu'un allumeur au butane ou des allumettes.



DES PARTICULES VOLANTES peuvent blesser les yeux.

- Le soudage, l'écaillement, le passage de la pièce à la brosse en fil de fer, et le meulage génèrent des étincelles et des particules métalliques volantes. Pendant la période de refroidissement des soudures, elles risquent de projeter du laitier.
- Porter des lunettes de sécurité avec écrans latéraux ou un écran facial.

LES ACCUMULATIONS DE GAZ risquent de provoquer des blessures ou même la mort.

- Fermer l'alimentation du gaz protecteur en cas de non utilisation.
- Veiller toujours à bien aérer les espaces confinés ou se servir d'un respirateur d'adduction d'air homologué.

DES PIÈCES CHAUDES peuvent provoquer des brûlures graves.

- Prévoir une période de refroidissement avant d'effectuer des travaux d'entretien.
- Porter des gants et des vêtements de protection pour travailler sur un moteur chaud.
- Ne pas toucher à mains nues les parties chaudes du moteur ni les pièces récemment soudées.

LE BRUIT peut affecter l'ouïe.

Le bruit des processus et des équipements peut affecter l'ouïe.

- Porter des protections approuvés pour les oreilles si le niveau sondre est trop élevé.

LES CHAMPS MAGNÉTIQUES peuvent affecter les stimulateurs cardiaques.

- Porteurs de stimulateur cardiaque, restez à distance.
- Les porteurs d'un stimulateur cardiaque doivent d'abord consulter leur médecin avant de s'approcher des opérations de soudage à l'arc, de gougeage ou de soudage par points.

Si des BOUTEILLES sont endommagées, elles pourront exploser.

Des bouteilles de gaz protecteur contiennent du gaz sous haute pression. Si une bouteille est endommagée, elle peut exploser. Du fait que les bouteilles de gaz font normalement partie du procédé de soudage, les manipuler avec précaution.

- Protéger les bouteilles de gaz comprimé d'une chaleur excessive, des chocs mécaniques, du laitier, des flammes ouvertes, des étincelles et des arcs.
- Placer les bouteilles debout en les fixant dans un support stationnaire ou dans un porte-bouteilles pour les empêcher de tomber ou de se renverser.
- Tenir les bouteilles éloignées des circuits de soudage ou autres circuits électriques.
- Ne jamais placer une torche de soudage sur une bouteille à gaz.
- Une électrode de soudage ne doit jamais entrer en contact avec une bouteille.
- Ne jamais souder une bouteille pressurisée – risque d'explosion.
- Utiliser seulement des bouteilles de gaz protecteur, régulateurs, tuyaux et raccords convenables pour cette application spécifique; les maintenir ainsi que les éléments associés en bon état.
- Ne pas tenir la tête en face de la sortie en ouvrant la soupape de la bouteille.
- Maintenir le chapeau de protection sur la soupape, sauf en cas d'utilisation ou de branchement de la bouteille.
- Lire et suivre les instructions concernant les bouteilles de gaz comprimé, les équipements associés et les publication P-1 CGA énumérées dans les normes de sécurité.

1-3. Dangers existant en relation avec le moteur

LE CARBURANT MOTEUR peut provoquer un incendie ou une explosion.

- Arrêter le moteur avant de vérifier le niveau de carburant ou de faire le plein.
- Ne pas faire le plein en fumant ou proche d'une source d'étincelles ou d'une flamme nue.
- Ne pas faire le plein de carburant à ras bord; prévoir de l'espace pour son expansion.
- Faire attention de ne pas renverser de carburant. Nettoyer tout carburant renversé avant de faire démarrer le moteur.
- Jeter les chiffons dans un récipient ignifuge.

LA VAPEUR ET LE LIQUIDE DE REFROIDISSEMENT CHAUD peuvent provoquer des brûlures.

- Il est préférable de vérifier le liquide de refroidissement une fois le moteur refroidi pour éviter de se brûler.
- Toujours vérifier le niveau de liquide de refroidissement dans le vase d'expansion (si présent), et non dans le radiateur (sauf si précisé autrement dans la section maintenance du manuel du moteur).
- Si le moteur est chaud et que le liquide doit être vérifié, opérer comme suivant :
- Mettre des lunettes de sécurité et des gants, placer un torchon sur le bouchon du radiateur.
- Dévisser le bouchon légèrement et laisser la vapeur s'échapper avant d'enlever le bouchon.

DES ORGANES MOBILES peuvent provoquer des blessures.

- Ne pas approcher les mains des ventilateurs, courroies et autres pièces en mouvement.
- Maintenir fermés et fixement en place les portes, panneaux, recouvrements et dispositifs de protection.
- Arrêter le moteur avant d'installer ou brancher l'appareil.
- Demander seulement à un personnel qualifié d'enlever les dispositifs de sécurité ou les recouvrements pour effectuer, s'il y a lieu, des travaux d'entretien et de dépannage.
- Pour empêcher tout démarrage accidentel pendant les travaux d'entretien, débrancher le câble négatif (–) de batterie de la borne.
- Ne pas approcher les mains, cheveux, vêtements lâches et outils des organes mobiles.
- Remettre en place les panneaux ou les dipositifs de protection et fermer les portes à la fin des travaux d'entretien et avant de faire démarrer le moteur.
- Avant d'intervenir, déposer les bougies ou injecteurs pour éviter la mise en route accidentelle du moteur.
- Bloquer le volant moteur pour éviter sa rotation lors d'une intervention sur le générateur.

L'EXPLOSION DE LA BATTERIE peut RENDRE AVEUGLE.

- Toujours porter une protection faciale, des gants en caoutchouc et vêtements de protection lors d'une intervention sur la batterie.
- Arrêter le moteur avant de débrancher ou de brancher les câbles de batterie.
- Eviter de provoquer des étincelles avec les outils en travaillant sur la batterie.
- Ne pas utiliser le poste de soudage pour charger les batteries ou des véhicules de démarrage rapide.
- Observer la polarité correcte (+ et –) sur les batteries.
- Débrancher le câble négatif (–) en premier lieu. Le rebrancher en dernier lieu.

L'ACIDE DE LA BATTERIE peut provoquer des brûlures dans les YEUX et sur la PEAU.

- Ne pas renverser la batterie.
- Remplacer une batterie endommagée.
- Rincer immédiatement les yeux et la peau à l'eau.

LES GAZ D'ÈCHAPPEMENT DU MOTEUR peuvent provoquer des accidents mortels.

- Utiliser l'équipement à l'extérieur dans des zones ouvertes et bien ventilées.
- En cas d'utilisation dans un endroit fermé évacuer les gaz d'échappement du moteur vers l'extérieur à distance des entrées d'air dans les bâtiments.

LA CHALEUR DU MOTEUR peut provoquer un incendie.

- Ne pas placer l'appareil sur, au-dessus ou à proximité de surfaces inflammables.
- Tenir à distance les produits inflammables de l'échappement.

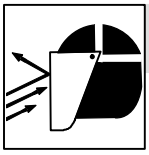
LES ÉTINCELLES À L'ÉCHAPPEMENT peuvent provoquer un incendie.

- Empêcher les étincelles d'échappement du moteur de provoquer un incendie.
- Utiliser uniquement un pare-étincelles approuvé – voir codes en vigueur.

1-4. Dangers supplémentaires en relation avec l'installation, le fonctionnement et la maintenance

LA CHUTE DE L'APPAREIL peut blesser.

- Utiliser l'anneau de levage uniquement pour soulever l'appareil lui-même ; sans chariot, de bouteilles de gaz, remorque, ou autres accessoires.
- Utiliser un équipement de levage de capacité suffisante pour lever l'appareil.
- En utilisant des fourches de levage pour déplacer l'unité, s'assurer que les fourches sont suffisamment longues pour dépasser du côté opposé de l'appareil.

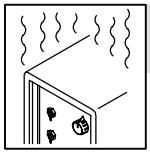


LES ÉTINCELLES VOLANTES risquent de provoquer des blessures.

- Porter un écran facial pour protéger le visage et les yeux.
- Affuterr l'électrode au tungstène uniquement à la meuleuse dotée de protecteurs. Cette manoeuvre est à exécuter dans un endroit sûr lorsque l'on porte l'équipement homologué de protection du visage, des mains et du corps.
- Les étincelles risquent de causer un incendie – éloigner toute substance inflammable.

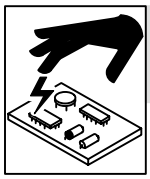
LE SURCHAUFFEMENT peut endommager le moteur électrique.

- Arrêter ou déconnecter l'équipement avant de démarrer ou d'arrêter le moteur.
- Ne pas laisser tourner le moteur trop lentement sous risque d'endommager le moteur électrique à cause d'une tension et d'une fréquence trop faibles.
- Ne pas brancher de moteur de 50 ou de 60 Hz à la prise de 100 Hz, s'il y a lieu.



L'EMPLOI EXCESSIF peut SURCHAUFFER L'ÉQUIPEMENT.

- Laisser l'équipement refroidir ; respecter le facteur de marche nominal.
- Réduire le courant ou le facteur de marche avant de poursuivre le soudage.
- Ne pas obstruer les passages d'air du poste.

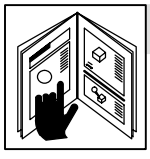


LES CHARGES ÉLECTROSTATIQUES peuvent endommager les circuits imprimés.

- Établir la connexion avec la barrette de terre avant de manipuler des cartes ou des pièces.
- Utiliser des pochettes et des boîtes antistatiques pour stocker, déplacer ou expédier des cartes de circuits imprimes.

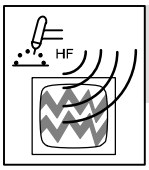
UNE REMORQUE QUI BASCULE peut entraîner des blessures.

- Utiliser les supports de la remorque ou des blocs pour soutenir le poids.
- Installer convenablement le poste sur la remorque comme indiqué dans le manuel s'y rapportant.



LIRE LES INSTRUCTIONS.

- Utiliser seulement les pièces de rechange d'origine.
- Effecteur la maintenance et la mise en service d'après le manuel et celui du moteur.



LE RAYONNEMENT HAUTE FRÉQUENCE (H.F.) risque de provoquer des interférences.

- Le rayonnement haute fréquence (H.F.) peut provoquer des interférences avec les équipements de radio–navigation et de communication, les services de sécurité et les ordinateurs.
- Demander seulement à des personnes qualifiées familiarisées avec des équipements électroniques de faire fonctionner l'installation.
- L'utilisateur est tenu de faire corriger rapidement par un électricien qualifié les interférences résultant de l'installation.
- Si le FCC signale des interférences, arrêter immédiatement l'appareil.
- Effectuer régulièrement le contrôle et l'entretien de l'installation.
- Maintenir soigneusement fermés les portes et les panneaux des sources de haute fréquence, maintenir les éclateurs à une distance correcte et utiliser une terre et et un blindage pour réduire les interférences éventuelles.

LE SOUDAGE À L'ARC risque de provoquer des interférences.

- L'énergie électromagnétique risque de provoquer des interférences pour l'équipement électronique sensible tel que les ordinateurs et l'équipement commandé par ordinateur tel que les robots.
- Veiller à ce que tout l'équipement de la zone de soudage soit compatible électromagnétiquement.
- Pour réduire la possibilité d'interférence, maintenir les câbles de soudage aussi courts que possible, les grouper, et les poser aussi bas que possible (ex. par terre).
- Veiller à souder à une distance de 100 mètres de tout équipement électronique sensible.
- Veiller à ce que ce poste de soudage soit posé et mis à la terre conformément à ce mode d'emploi.
- En cas d'interférences après avoir pris les mesures précédentes, il incombe à l'utilisateur de prendre des mesures supplémentaires telles que le déplacement du poste, l'utilisation de câbles blindés, l'utilisation de filtres de ligne ou la pose de protecteurs dans la zone de travail.

1-5. Principales normes de sécurité

Safety in Welding and Cutting, norme ANSI Z49.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

Safety and Health Sandards, OSHA 29 CFR 1910, du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practice for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, norme AWS F4.1, de l'American Welding Society, 550 N.W. Lejeune Rd, Miami FL 33126

National Electrical Code, NFPA Standard 70, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, de la Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Règles de sécurité en soudage, coupage et procédés connexes, norme CSA W117.2, de l'Association canadienne de normalisation, vente de normes, 178 Rexdale Boulevard, Rexdale (Ontario) Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, norme ANSI Z87.1, de l'American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting and Welding Processes, norme NFPA 51B, de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

1-6. Information sur les champs électromagnétiques

Données sur le soudage électrique et sur les effets, pour l'organisme, des champs magnétiques basse fréquence

Le courant de soudage, pendant son passage dans les câbles de soudage, causera des champs électromagnétiques. Il y a eu et il y a encore un certain souci à propos de tels champs. Cependant, après avoir examiné plus de 500 études qui ont été faites pendant une période de recherche de 17 ans, un comité spécial ruban bleu du National Research Council a conclu: "L'accumulation de preuves, suivant le jugement du comité, n'a pas démontré que l'exposition aux champs magnétiques et champs électriques à haute fréquence représente un risque à la santé humaine". Toutefois, des études sont toujours en cours et les preuves continuent à être examinées. En attendant que les conclusions finales de la recherche soient établies, il vous serait souhaitable de réduire votre exposition aux champs électromagnétiques pendant le soudage ou le coupage.

Afin de réduire les champs électromagnétiques dans l'environnement de travail, respecter les consignes suivantes :

1 Garder les câbles ensembles en les torsadant ou en les attachant avec du ruban adhésif.

2 Mettre tous les câbles du côté opposé de l'opérateur.

3 Ne pas courber pas et ne pas entourer pas les câbles autour de votre corps.

4 Garder le poste de soudage et les câbles le plus loin possible de vous.

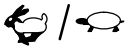
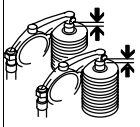
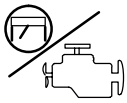
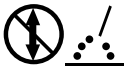
5 Relier la pince de masse le plus près possible de la zone de soudure.

Consignes relatives aux stimulateurs cardiaques :

Les personnes qui portent un stimulateur cardiaque doivent avant tout consulter leur docteur. Si vous êtes déclaré apte par votre docteur, il est alors recommandé de respecter les consignes ci–dessus.

SECTION 2 – DEFINITIONS

2-1. Symbol Definitions

Stop Engine	Fast (Run, Weld/Power)	 Fast/Slow (Run/Idle)	Slow (Idle)
Start Engine	Panel/Local	Temperature	Fuel
Engine Oil	On	 Check Valve Clearance	Battery (Engine)
 Engine	Read Operator's Manual	**A** Amperes	**V** Volts
MIG (GMAW), Wire	Stick (SMAW)	TIG (GTAW)	Circuit Breaker
Foot Control	Manual Control	Touch Start (GTAW)	Pulsed
Positive	Negative	Alternating Current (AC)	Output
Time	**h** Hours	**s** Seconds	Protective Earth (Ground)
 Do not switch while welding	**14** Remote 14 Receptacle	Work Connection	Glow Plug
Wire Feed	Electrode Positive	Electrode Negative	High Temperature

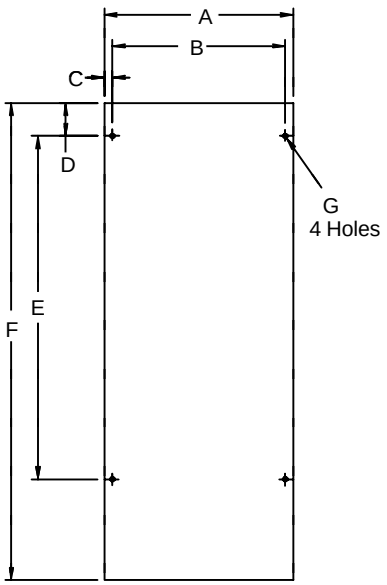
SECTION 3 – SPECIFICATIONS

3-1. Weld, Power, And Engine Specifications

Welding Mode	Rated Welding Output	Maximum Open-Circuit Voltage	Amperage Range In CC Mode	Voltage Range In CV Mode	Auxiliary Power Rating	Fuel Capacity	Engine
CC/DC	300 A, 32 V, 60% duty Cycle	90	5 – 375 A	10 – 34 V	Single-Phase, 12 kVA/kW 100/50 A, 120/240 V AC, 60 Hz	13 gal (49 L) Tank	Kubota DH905 Water-Cooled, Three-Cylinder, Four-Cycle, 26 HP Diesel Engine
CV/DC							

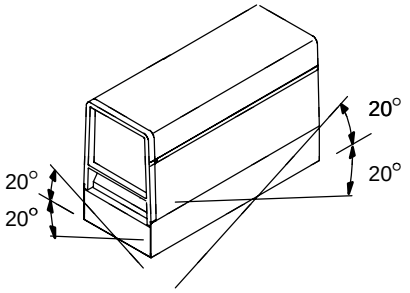
3-2. Dimensions, Weights, and Operating Angles

Dimensions	
Height	36 in (914 mm)
Width	24 in (610 mm)
Depth	59 in (1499 mm)
A	19-7/8 in (505 mm)
B	18 in (457 mm)
C	1 in (25 mm)
D	15-5/8 in (397 mm)
E	26-3/8 in (679 mm)
F	58-3/4 in (1492 mm)
G	13/32 in (10 mm) Dia.
Weight	
925 lb (420 kg)	



▲ **Do not exceed tilt angles or engine could be damaged or unit could tip.**

▲ **Do not move or operate unit where it could tip.**

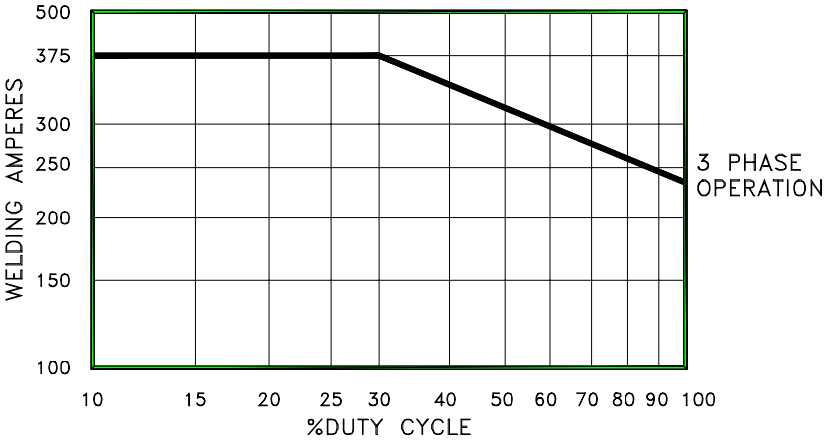


3-3. Duty Cycle And Overheating

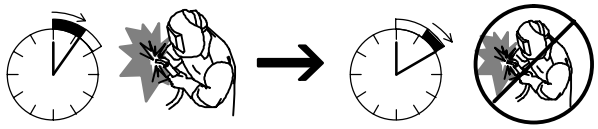
Duty Cycle is percentage of 10 minutes that unit can weld at rated load without overheating.

If unit overheats, output stops, a Help message is displayed (see Section 7-9), and cooling fan runs. Wait fifteen minutes for unit to cool. Reduce amperage or voltage, or duty cycle before welding.

▲ **Exceeding duty cycle can damage unit and void warranty.**

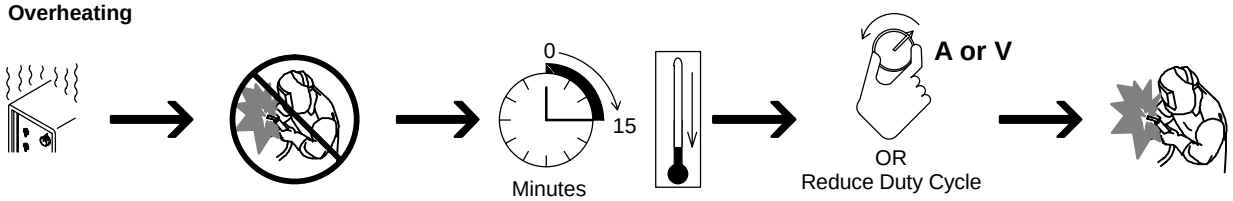


60% Duty Cycle



6 Minutes Welding — 4 Minutes Resting

Overheating

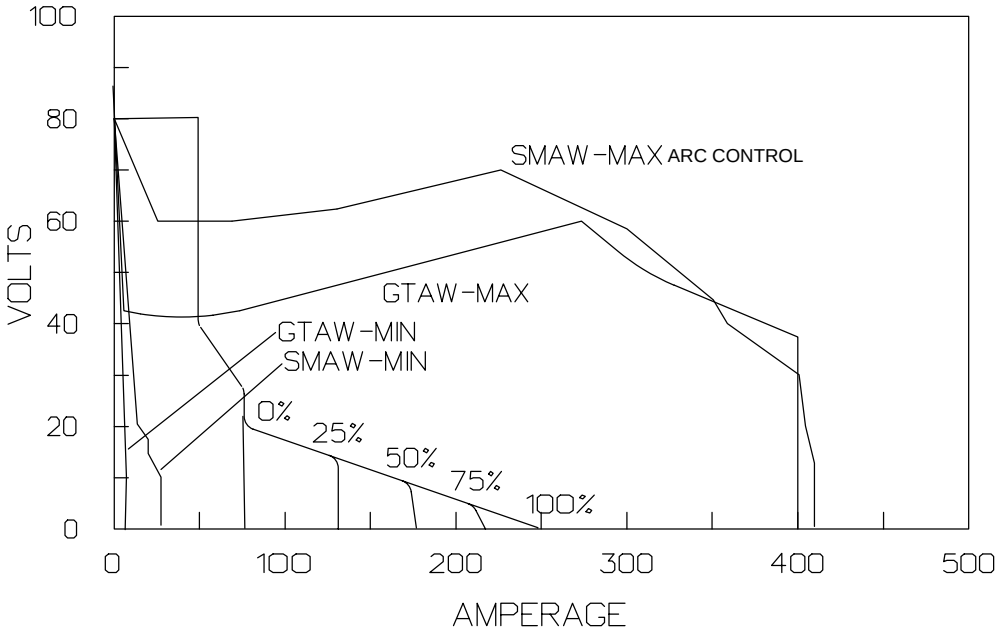


sduty1 5/95 / 196 698

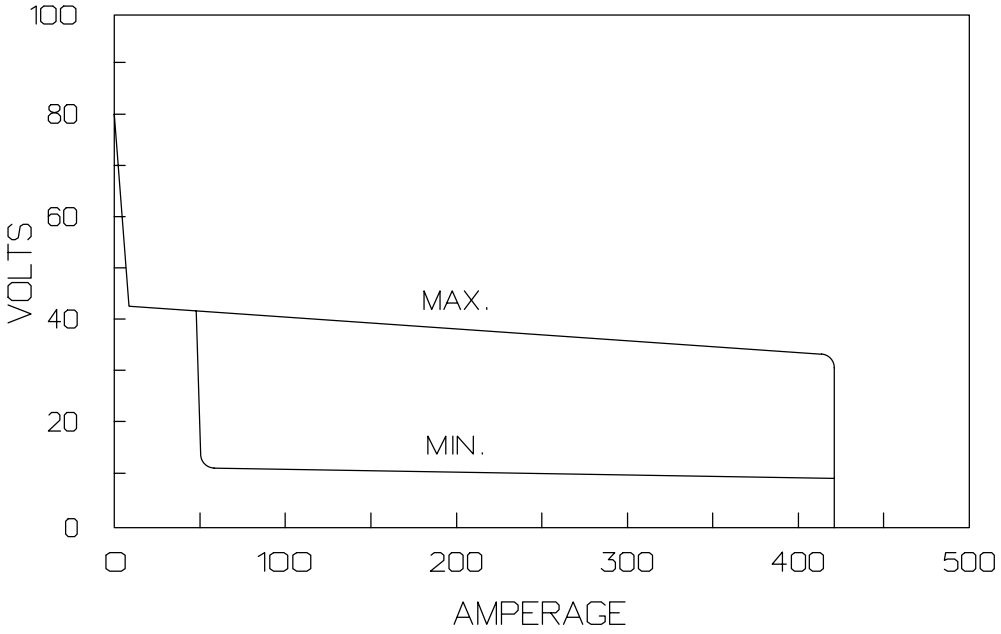
3-4. Volt-Ampere Curves

Volt-ampere curves show minimum and maximum voltage and amperage output capabilities of unit. Curves of other settings fall between curves shown.

A. CC Mode

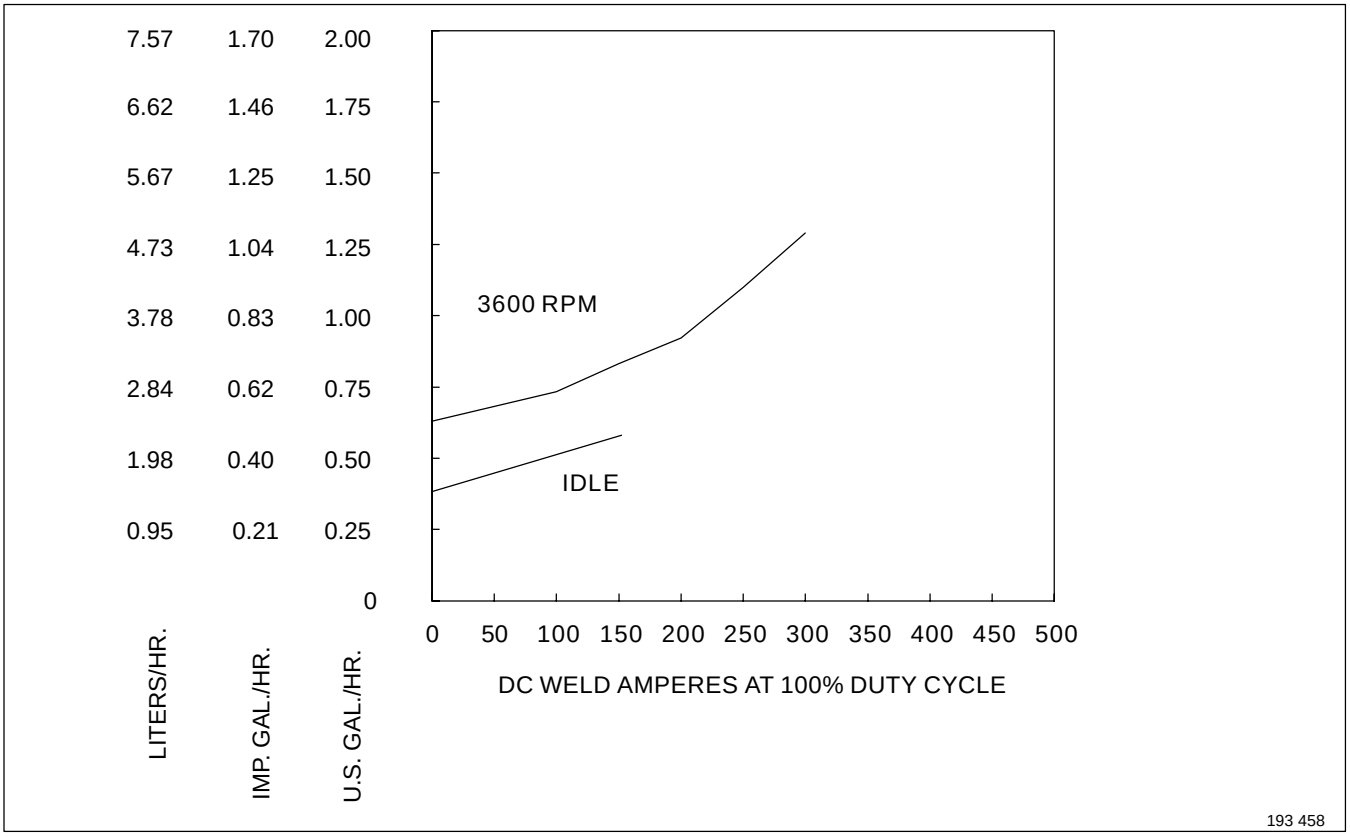


B. CV Mode



178 652 / 178 653

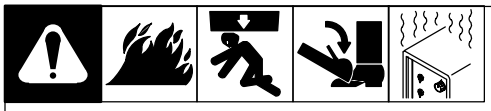
3-5. Fuel Consumption



193 458

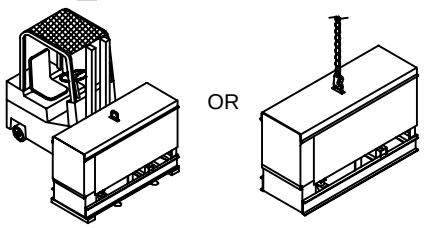
SECTION 4 – INSTALLATION

4-1. Installing Welding Generator

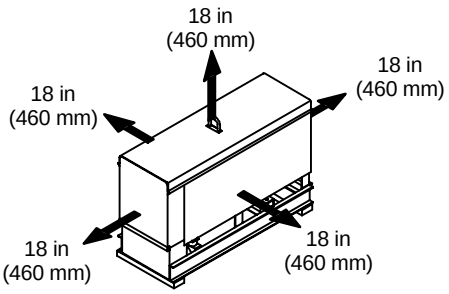


Movement

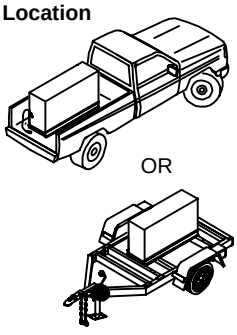
▲ **Do not lift unit from end.**



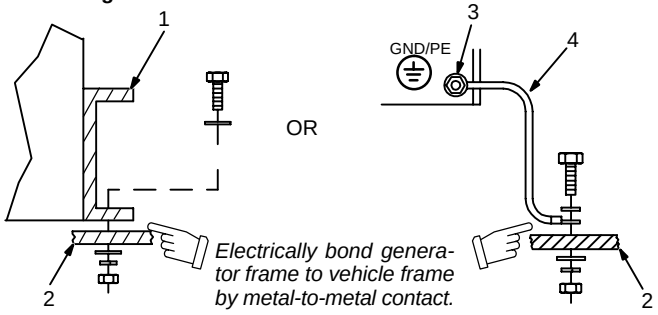
Airflow Clearance



Location



Grounding



Electrically bond generator frame to vehicle frame by metal-to-metal contact.

▲ **Do not weld on base. Welding on base can cause fuel tank fire or explosion. Bolt unit down using holes provided in base.**

▲ **Always ground generator frame to vehicle frame to prevent electric shock and static electricity hazards.**

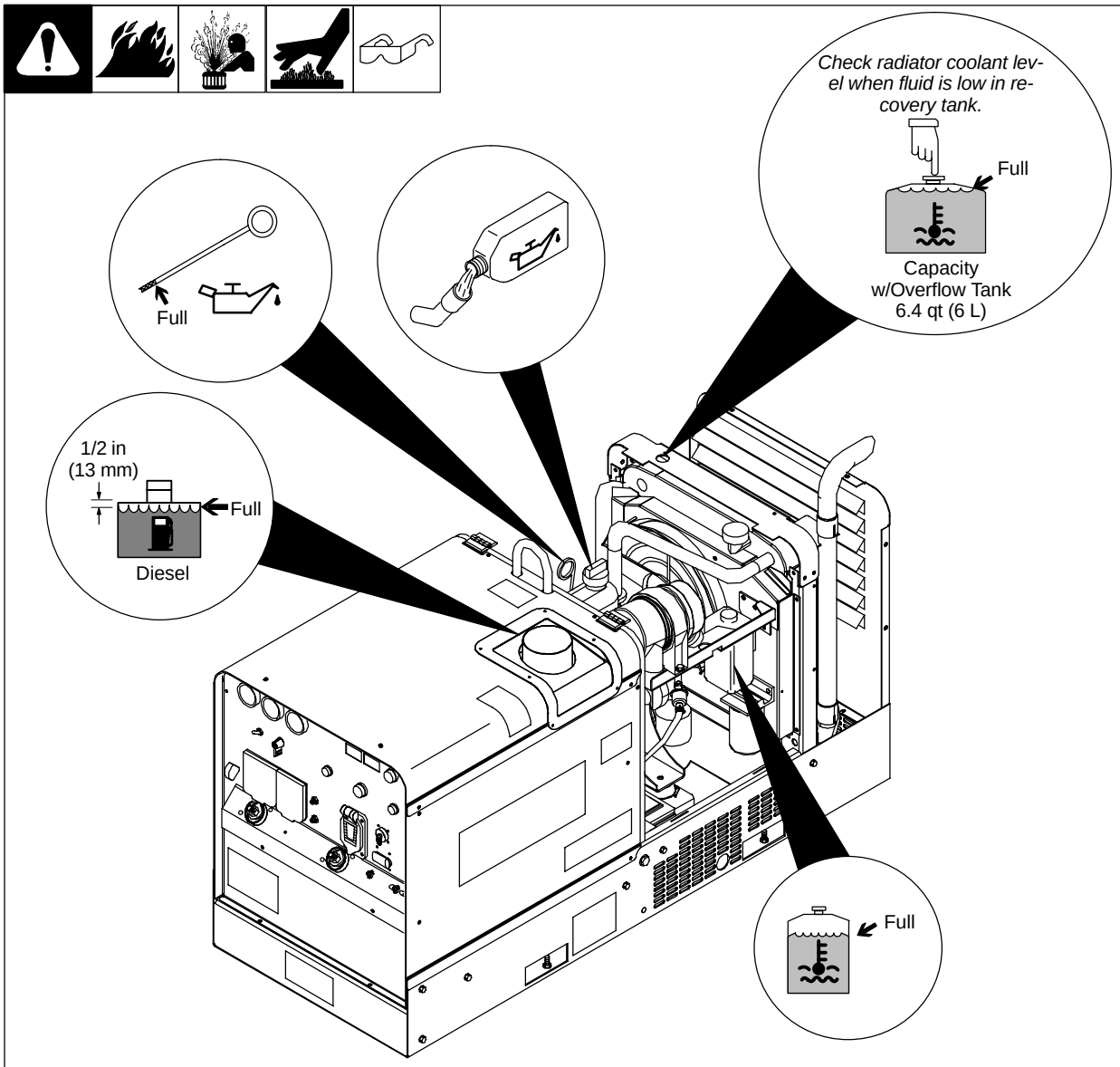
1 Generator Base
2 Metal Vehicle Frame
3 Equipment Grounding Terminal
4 Grounding Cable

Use #10 AWG or larger insulated copper wire.

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

install1 12/99 – Ref. 800 652 / Ref. 800 477-A / 158 936-A / S-0854

4-2. Engine Prestart Checks



802 330-B

Check all fluids daily. Engine must be cold and on a level surface. Unit is shipped with 10W30 engine oil.

Engine stops if oil pressure is too low or engine temperature is too high.

☞ *This unit has a low oil pressure shutdown switch. However, some conditions may cause engine damage before the engine shuts down. Check oil level often and do not use the oil pressure shutdown system to monitor oil level.*

Follow run-in procedure in engine manual. If unburned fuel and oil collect in exhaust pipe during run-in, see Section 9.

Fuel

▲ **Do not use gasoline. Gasoline will damage engine.**

Add fresh diesel fuel before starting engine the first time (see maintenance label for specifications). Fill fuel tank up to 1/2 in. (13 mm) from top to allow room for expansion.

Do not run out of fuel or air enters fuel system and causes starting problems. See engine manual to bleed air from fuel system.

Oil

After fueling, check oil with unit on level surface. If oil is not up to full mark on dipstick, add oil (see maintenance label).

▲ **Engine may use oil and wetstacking may occur during run-in period. Check oil several times daily during run-in.**

Coolant

Check coolant level in recovery tank before starting unit the first time. Add coolant if coolant is below bottom of radiator filler neck (see Section 4-3 for radiator filling instructions.

Check coolant in recovery tank daily. If coolant is below Full level, add coolant until coolant level in tank is between Full and Low levels. If recovery tank coolant level was low, also check coolant level in radiator (see Section 4-3).

Engine coolant is a mixture of water and ethylene glycol base antifreeze. A solution of 50% antifreeze and 50% water must be used in this engine. Do not use 100% antifreeze or severe damage will occur.

Keep radiator and air intake clean and free of dirt.

▲ **Incorrect engine temperature can damage engine. Do not run engine without a properly working thermostat and radiator cap.**

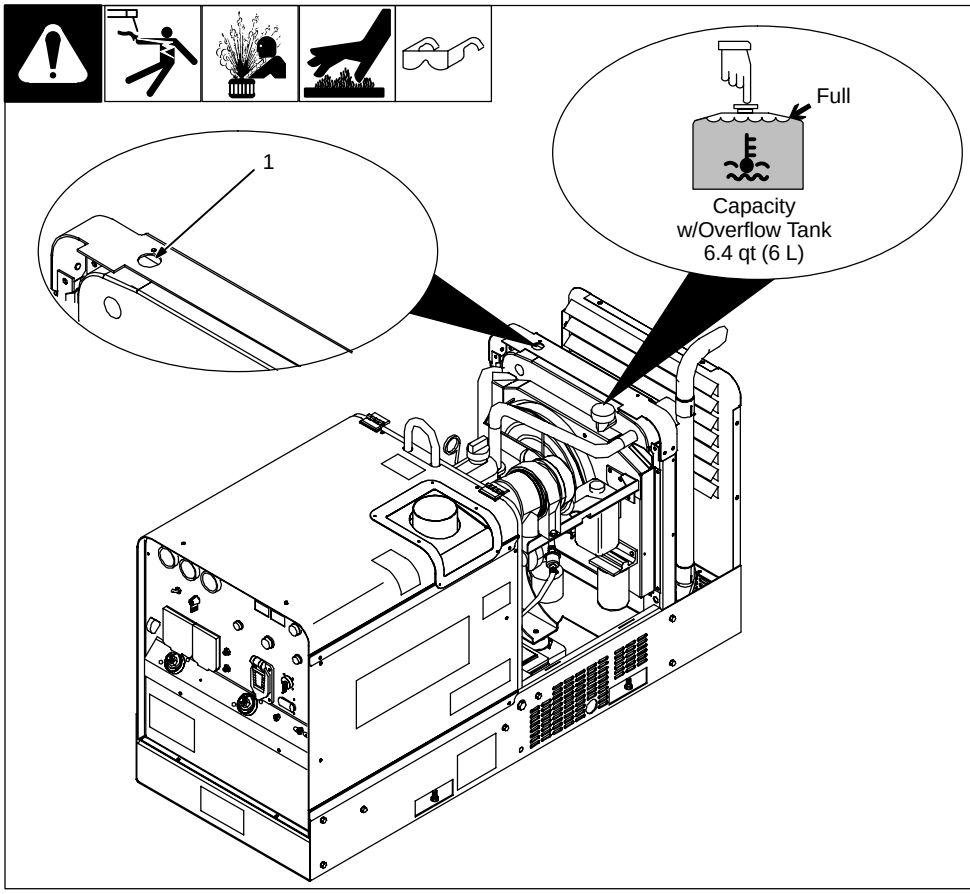
☞ *To improve cold weather starting:*

Keep battery in good condition. Store battery in warm area off concrete surface.

Use fuel formulated for cold weather (diesel fuel can gel in cold weather). Contact local fuel supplier for fuel information.

Use correct grade oil for cold weather.

4-3. Adding Coolant To Radiator



▲ **Stop engine and let cool.**

☞ *Check coolant level according to Section 4-2 before starting this procedure.*

If coolant level is below bottom of radiator filler neck, add coolant as follows:

1 Radiator Air Bleed Screw

Remove radiator air bleed screw. Add coolant to radiator until coolant is at bottom of filler neck. This ensures all air is purged from the system.

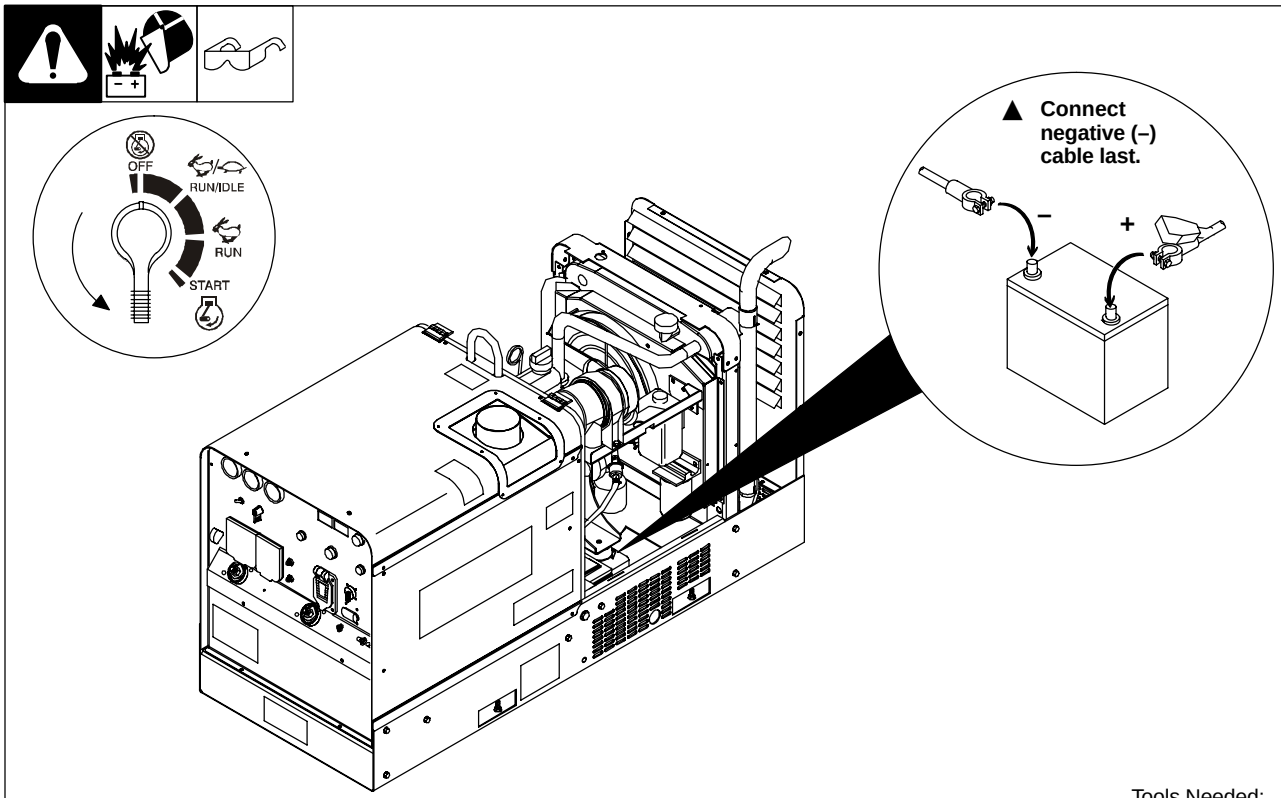
Reinstall screw and radiator cap. Check coolant level in recovery tank (see Section 4-2).

Engine coolant is a mixture of water and ethylene glycol base antifreeze. A solution of 50% antifreeze and 50% water must be used in this engine. Do not use 100% antifreeze or severe damage will occur.

Tools Needed:

Ref. 802 330-B

4-4. Connecting The Battery

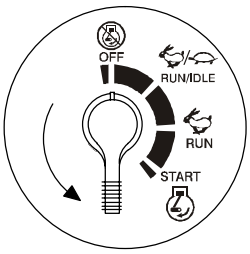


Tools Needed:

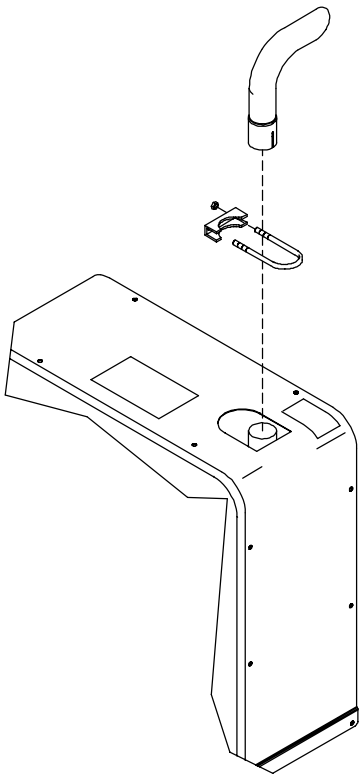
3/8, 1/2 in

Ref. 189 438-A / 802 330-B / Ref. S-0756-D

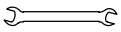
4-5. Installing Exhaust Pipe



☞ *Point exhaust pipe in desired direction. If unit is truck or trailer mounted, point pipe away from direction of travel.*



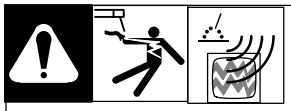
Tools Needed:

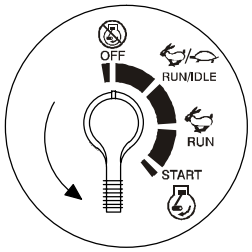


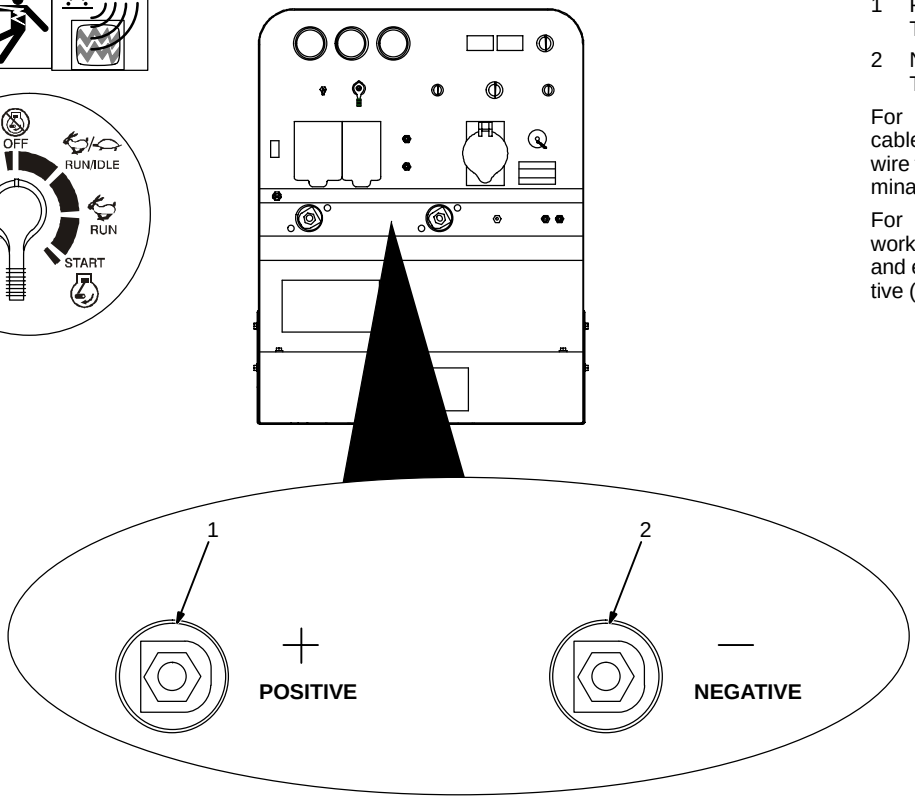
1/2 in

802 173-B / Ref. 189 438-A

4-6. Connecting To Weld Output Terminals







1 Positive (+) Weld Output Terminal

2 Negative (–) Weld Output Terminal

For MIG welding, connect work cable to Negative (–) terminal and wire feeder cable to Positive (+) terminal.

For Stick/TIG welding, connect work cable to Negative (–) terminal and electrode holder cable to Positive (+) terminal.

801 941-A / Ref. 189 438-A / 802 174-E

4-7. Selecting Weld Cable Sizes

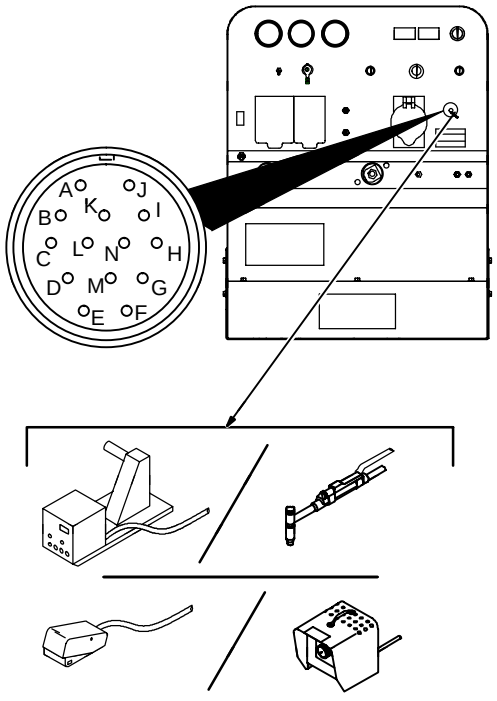
Welding Amperes	Total Cable (Copper) Length In Weld Circuit Not Exceeding							
	100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 – 60% Duty Cycle	60 – 100% Duty Cycle	10 – 100% Duty Cycle					
100	4	4	4	3	2	1	1/0	1/0
150	3	3	2	1	1/0	2/0	3/0	3/0
200	3	2	1	1/0	2/0	3/0	4/0	4/0
250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0
350	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0	2-4/0

*Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere. Contact your distributor for the mm^2 equivalent weld cable sizes.

S-0007-E

4-8. Remote 14 Receptacle RC5 Information

NOTE ☞ *Engine runs at weld/power speed whenever a device connected to the remote 14 receptacle is running.*



802 174-E

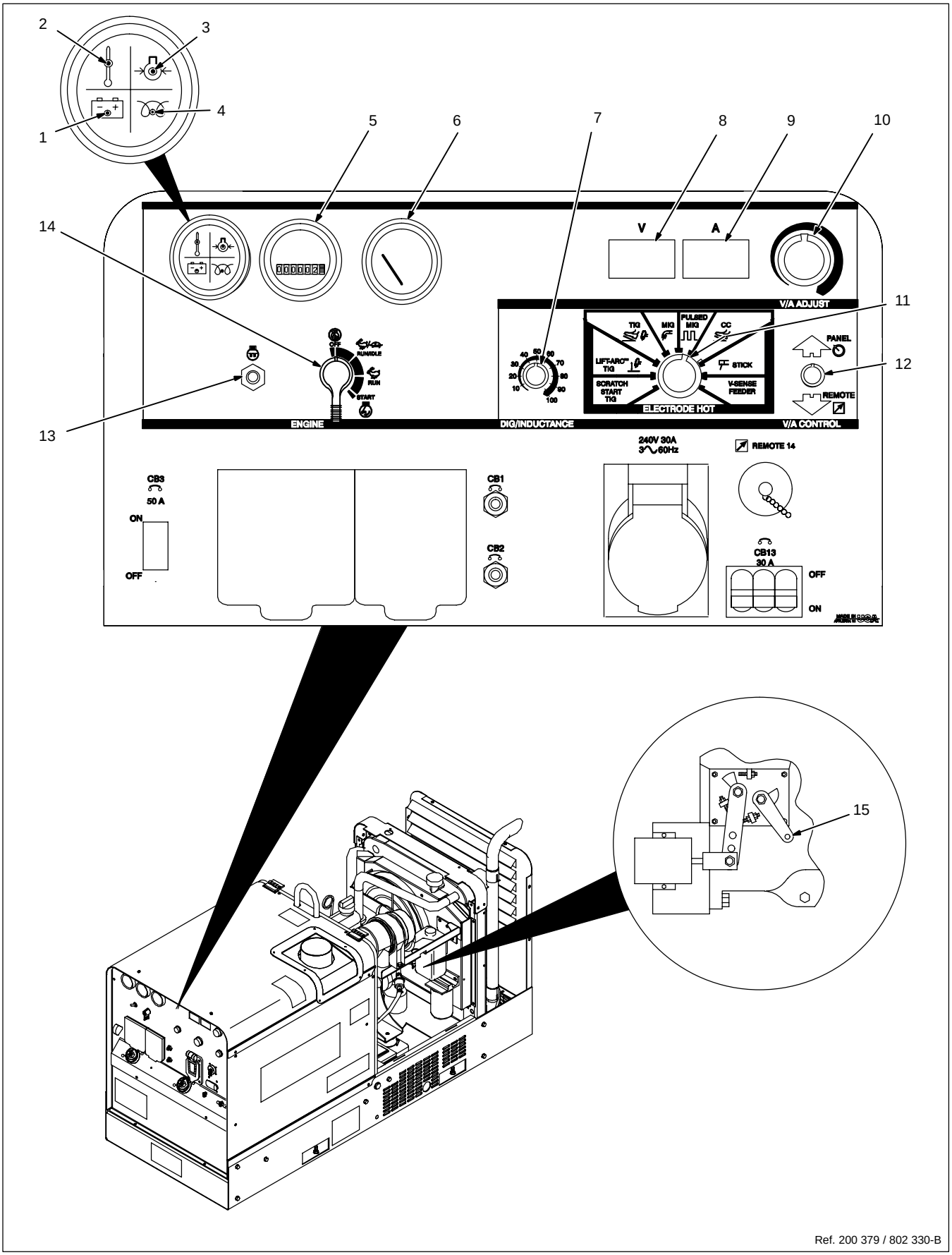
REMOTE 14	Socket*	Socket Information
24 VOLTS AC OUTPUT (CONTACTOR)	A	24 volts ac. Protected by circuit breaker CB11.
	B	Contact closure to A completes 24 volts ac contactor control circuit.
115 VOLTS AC OUTPUT (CONTACTOR)	I	115 volts ac. Protected by circuit breaker CB12.
	J	Contact closure to I completes 115 volts ac contactor control circuit.
REMOTE OUTPUT CONTROL	C	Output to remote control; 0 to +10 volts dc, +10 volts dc in MIG mode.
	D	Remote control circuit common.
	E	0 to +10 volts dc input command signal from remote control.
	M	CC/CV select (CC/CV models).
A/V AMPERAGE VOLTAGE	F	Current feedback; +1 volt dc per 100 amperes.
	H	Voltage feedback; +1 volt dc per 10 output receptacle volts.
GND	G	Circuit common for 24 and 115 volts ac circuits.
	K	Chassis common.

*The remaining sockets are not used.

Notes

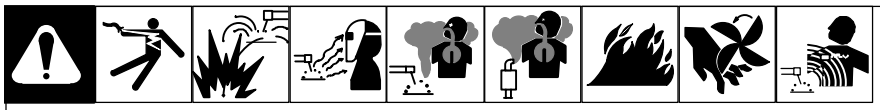
SECTION 5 – OPERATING WELDING GENERATOR

5-1. Controls (See Section 5-2)



Ref. 200 379 / 802 330-B

5-2. Description Of Controls (See Section 5-1)



☞ *The fan motor is thermostatically controlled and only runs when cooling is needed.*

Engine Lights

1 Battery Charging Light

Light goes on if engine alternator is not charging battery. Engine continues to run.

▲ **Stop engine and fix trouble if Battery Charging light goes on.**

2 Engine Temperature Light

Light goes on and engine stops if engine temperature is too high.

▲ **Stop engine and fix trouble if Engine Temperature light goes on.**

3 Engine Oil Pressure Light

Light goes on and engine stops if oil pressure is too low. Light goes on momentarily during start-up but goes out when engine reaches normal oil pressure.

▲ **Stop engine and fix trouble if Engine Oil Pressure light stays on after start-up.**

4 Glow Plug Light

Light goes on when glow plug is energized and warming up. Glow plug warms in about six seconds and engine can be started (see starting instructions following).

▲ **Do not use glow plug longer than 20 seconds.**

Engine Gauges

5 Engine Hour Meter

6 Fuel Gauge

Weld Controls

7 Dig/Inductance Control

Control adjusts Dig when Stick mode is selected on mode switch. When control is set toward minimum, short-circuit amperage at low arc voltage is the same as normal welding amperage.

When set toward maximum, short-circuit amperage is increased at low arc voltage to assist with arc starts and help prevent the electrode from sticking while welding (see volt-ampere curves in Section 3-4).

Select setting best suited for application.

Control adjusts inductance when MIG or V-Sense Feeder position is selected on the mode switch. Inductance determines the "wetness" of the weld puddle. When set toward maximum, "wetness" (puddle fluidity) increases.

When Pulsed MIG or one of the TIG modes is selected, this control is not functional.

8 Voltmeter

Meter displays weld voltage and help messages (see Sections 5-3 and 7-9).

9 Ammeter

Meter displays weld amperage and help messages (see Sections 5-3 and 7-9).

10 V/A (Voltage/Amperage) Adjustment Control

11 Mode Switch

The Mode switch setting determines both the process and output On/Off control (see Section 5-4). Source of control (panel or remote) for the amount of output is selected by the V/A Control switch.

For Air Carbon Arc (CAC-A) cutting and gouging, place switch in Stick position. For best results, place Inductance/Dig control in the maximum position.

12 V/A (Voltage/Amperage) Control Switch

For front panel control, place switch in Panel position and use the V/A Adjustment control.

For remote control, make connections to Remote 14 receptacle, and place switch in Remote position. In most modes, remote control is a percent of V/A Adjustment control setting (value selected on V/A Adjustment control is maximum available on remote). In the MIG mode, remote control provides full range of unit output regardless of V/A Adjust control setting.

Engine Starting Controls

13 Glow Plug Switch

Use switch to energize glow plug for cold weather starting. Glow plug warms in about six seconds and engine can be started (see starting instructions following).

14 Engine Control Switch

Use switch to start engine, select speed, and stop engine. In Run/Idle position, engine runs at idle speed at no load, and weld/power speed under load. In Run position, engine runs at weld/power speed.

☞ *Place switch in Run position to operate most GMAW equipment.*

To Start:

Above 32° F: turn Engine Control switch to Start. Release switch when engine starts and Engine Oil Pressure light goes out.

☞ *If engine does not start, let engine come to a complete stop before attempting restart.*

Below 32° F: turn engine control switch to Run/Idle position. Push Glow Plug switch up and hold about six seconds. Turn Engine Control switch to Start. Release switch when engine starts and Engine Oil Pressure light goes out. Do not crank engine while engine is turning.

☞ *If engine does not start, let engine come to a complete stop before attempting restart.*

To Stop: turn Engine Control switch to Off position.

☞ *Push engine stop lever to stop engine if Engine Control switch does not work (see item 15).*

15 Engine Stop Lever

Use lever to stop engine if Engine Control switch does not work.

5-3. Meter Functions

NOTE ☞ *The meters display the actual weld output values for approximately three seconds after the arc is broken.*

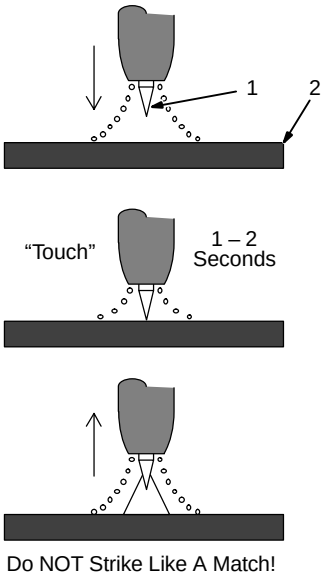
Mode	Meter Reading At Idle		Meter Reading While Welding	
Scratch Start TIG	V **80.0** Actual Volts (OCV)	A **85** Preset Amps	V **10.3** Actual Volts	A **85** Actual Amps
Lift-Arc TIG	V **7.0** Actual Volts	A **85** Preset Amps	V **10.3** Actual Volts	A **85** Actual Amps
TIG	V Blank	A **85** Preset Amps	V **10.3** Actual Volts	A **85** Actual Amps
MIG	V **24.5** Preset Volts	A Blank	V **24.5** Actual Volts	A **250** Actual Amps
Pulsed MIG	V **PPP** Pulse Display	A **PPP** Pulse Display	V **24.5** Actual Volts	A **250** Actual Amps
CC	V Blank	A **85** Preset Amps	V **24.5** Actual Volts	A **85** Actual Amps
Stick	V **80.0** Actual Volts (OCV)	A **85** Preset Amps	V **24.5** Actual Volts	A **85** Actual Amps
V-Sense Feeder	V **80.0** Flashes OCV And Preset	A Blank	V **24.5** Actual Volts	A **250** Actual Amps

5-4. Mode Switch Settings

NOTE ☞ *The Stick and CC modes provide the* Adaptive Hot Start™ *feature, which automatically increases the output amperage at the start of a weld should the start require it. This eliminates electrode sticking at arc start.*

Mode Switch Setting	Process	Output On/Off Control
Scratch Start TIG	GTAW	Electrode Hot
Lift-Arc TIG	GTAW – See Section 5-5	Electrode Hot
TIG	GTAW With HF Unit, Pulsing Device, Or Remote Control	At Remote 14
MIG	GMAW	At Remote 14
Pulsed MIG	GMAW-P (Requires an external pulsing device.)	At Remote 14
CC	Stick (SMAW) With Remote On/Off	At Remote 14
Stick	SMAW	Electrode Hot
V-Sense Feeder	MIG (GMAW) With Voltage Sensing Wire Feeder	Electrode Hot

5-5. Lift-Arc TIG Procedure



Do NOT Strike Like A Match!

With Mode Switch in the Lift-Arc TIG position, start an arc as follows:

1 TIG Electrode

2 Workpiece

Touch tungsten electrode to workpiece at weld start point, **hold electrode to workpiece for 1-2 seconds**, and slowly lift electrode. An arc will form when electrode is lifted.

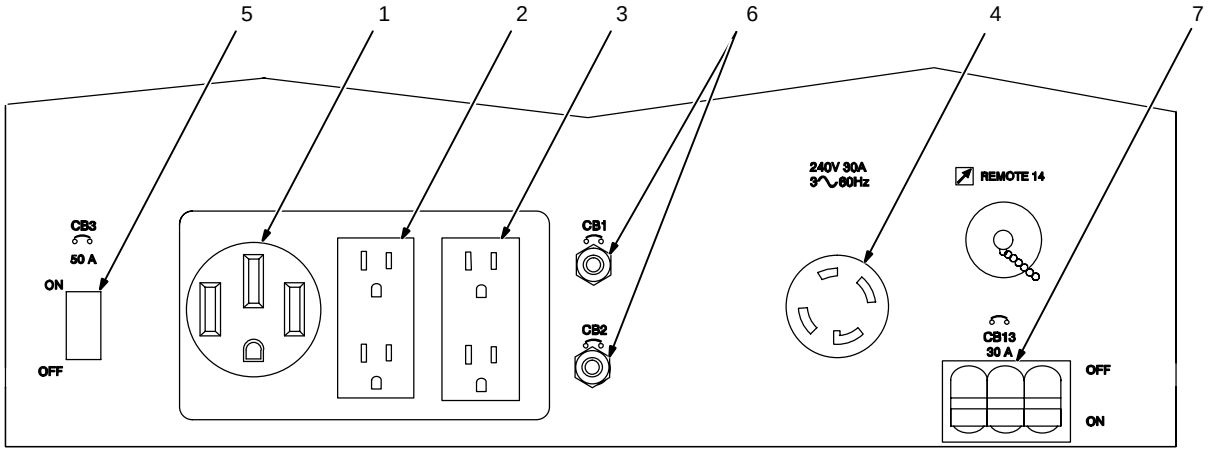
Normal open-circuit voltage is not present before tungsten electrode touches workpiece; only a low sensing voltage is present between electrode and workpiece. The solid-state output contactor does not energize until after electrode is touching workpiece. This allows electrode to touch workpiece without overheating, sticking, or getting contaminated.

Ref. S-156 279

Notes

SECTION 6 – OPERATING AUXILIARY EQUIPMENT

6-1. Auxiliary Power Receptacles And Circuit Breakers



SIMULTANEOUS WELDING AND AUXILIARY POWER				
Weld Current In Amperes	**Total Power In Watts**	**120 V Receptacle Amperes**	**Single-Phase 240 V Receptacle Amperes**	**Three-Phase 240 V Receptacle Amperes**
350	11900	–	–	–
300	9600	16	5	4
250	7500	38	15	10
200	5600	40	30	13
150	3900	40	35	19
100	2400	40	40	23
50	1100	40	45	26
0	0	40	50	30

200 379 / 189 438-B

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

☞ *Auxiliary power decreases as weld current increases.*

1 240 V 50 A AC Receptacle RC3

RC3 supplies 60 Hz single-phase power at weld/power speed. Maximum output is 12 kVA/kW.

2 120 V 15 A AC Duplex Receptacle RC2

3 120 V 15 A AC Duplex Receptacle RC1

RC2 and RC1 supply 60 Hz single-phase power at weld/power speed. Maximum output from RC2 or RC3 is 1.8 kVA/kW.

4 240 V 30 A, AC Twistlock Receptacle RC6

RC6 supplies 60 Hz three-phase power at weld/power speed. Maximum output is 12 kVA/kW.

5 Circuit Breaker CB3

CB3 protects RC1, RC2, and RC3 from overload. If CB3 opens, RC1, RC2, and RC3 do not work. Place switch in On position to reset breaker.

6 Circuit Breakers CB1 And CB2

CB1 protects RC1 and CB2 protects RC2 from from overload. If CB1 or CB2 opens, the receptacle does not work. Press button to reset breaker.

7 Circuit Breaker CB13

CB13 protects RC6 from overload. If CB13 opens, the receptacle does not work. Push breaker bar up to reset.

☞ *If a breaker continues to open, contact Factory Authorized Service Agent.*

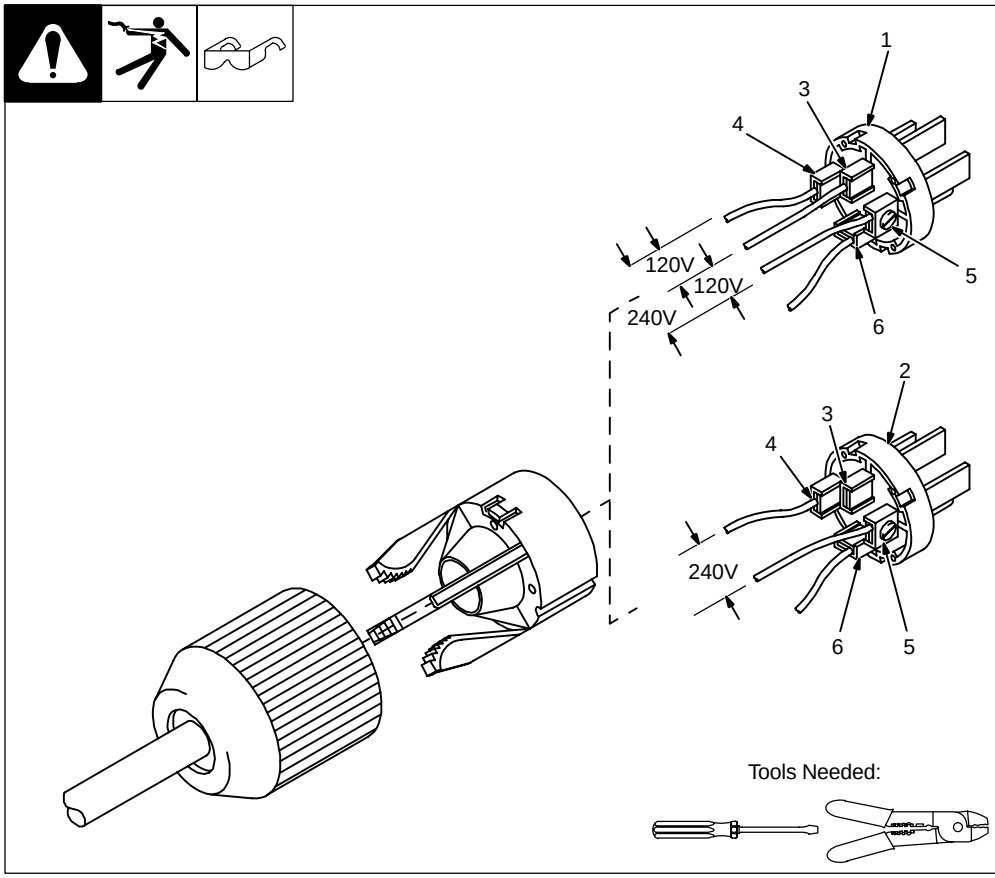
Combined output of all receptacles limited to 12 kVA/kW rating of the generator.

EXAMPLE: If 13 A is drawn from RC1 and RC2, only 37 A is available at RC3:

2 x (120 V x 13 A) + (240 V x 28 A) = 12 kVA/kW

8 Auxiliary Power While Welding Table

6-2. Wiring Instructions For Optional 240 Volt, Single-Phase Plug (NEMA 14-50P)



The plug can be wired for a 240 V, 2-wire load or a 120/240V, 3-wire load. See circuit diagram.

1 Plug Wired for 120/240 V, 3-Wire Load

When wired for 120 V loads, each duplex receptacle shares a load with one half of 240 V receptacle.

2 Plug Wired for 240 V, 2-Wire Load

3 Neutral (Silver) Terminal

4 Load 1 (Brass)Terminal

5 Load 2 (Brass) Terminal

6 Ground (Green) Terminal

Strip cord jacket back enough to separate conductors.

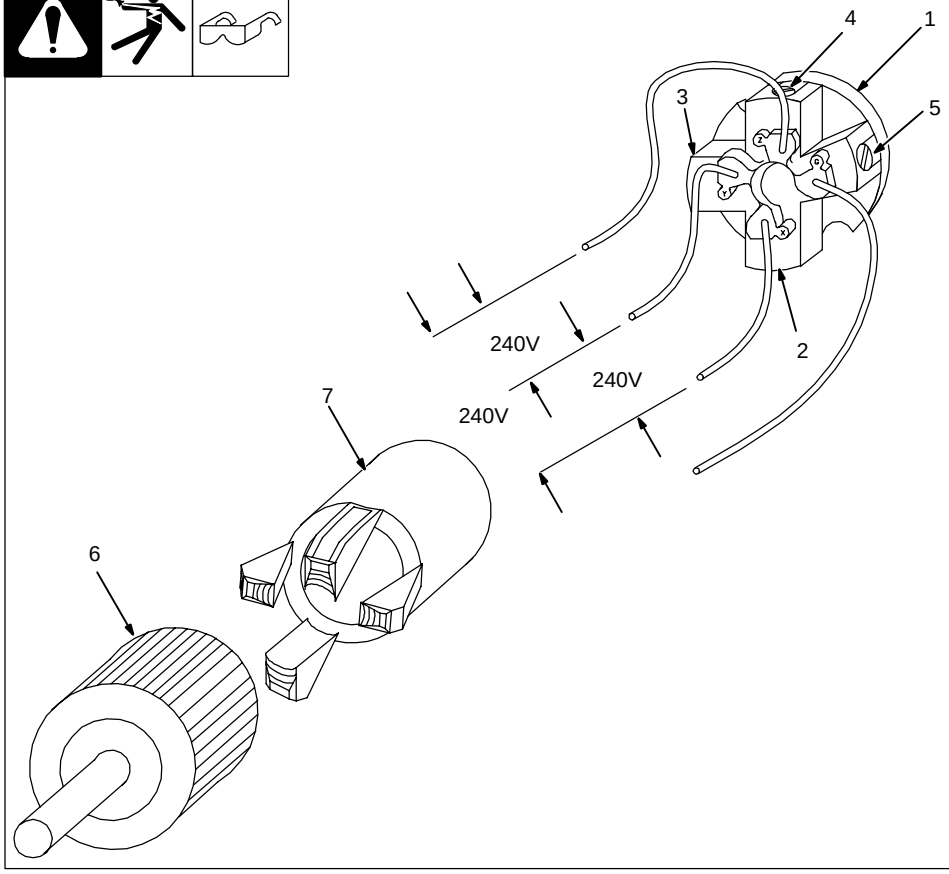
Strip conductors enough to make good contact with plug terminals. Make plug connections and reinstall outer shell and cord grip.

Tighten assembly screws onto shell. Do not overtighten.

Tools Needed:

Plug1 7/99 – ST-120 813-D

6-3. Wiring Instructions For Optional 240 Volt, 3-Phase Twistlock Plug (NEMA L15-30P)



1 240 V AC Three-Phase, 30 A, 3P4W Twistlock Plug

2 Load 1 (Brass) Terminal (X)

3 Load 2 (Brass)Terminal (Y)

4 Load 3 (Brass) Terminal (Z)

5 Ground (Green) Terminal (G)

6 Outer Shell

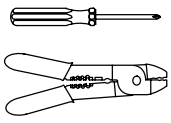
7 Cord Grip

Strip cord jacket back enough to separate conductors.

Strip conductors enough to make good contact with plug terminals. Make plug connections and reinstall outer shell and cord grip.

Tighten assembly screws onto shell. Do not overtighten.

Tools Needed:

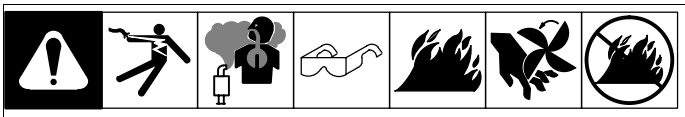


Plug2 7/99 – 802 437

SECTION 7 – MAINTENANCE AND TROUBLESHOOTING

7-1. Routine Maintenance

Note ☞ *Follow the storage procedure in the engine owner's manual if the unit will not be used for an extended period.*



Recycle engine fluids.

▲ **Stop engine before maintaining.**

☞ *See also Engine Manual and Maintenance Label. Service engine more often if used in severe conditions.*

* To be done by Factory Authorized Service Agent.

8 h

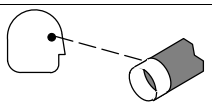
Wipe Up Spills.

Check Fluid Levels. See Section 4-2.

Drain Water From Fuel System. See Section 7-5.

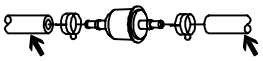
20 h

Check and clean optional spark arrestor screen. See Section 7-4.

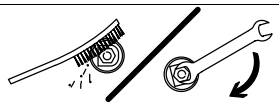


50 h

Check fuel lines and connections. See Section 7-5.



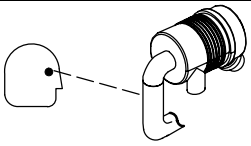
Clean and tighten weld terminals.



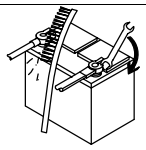
100 h

Service air filter element. See Section 7-3.

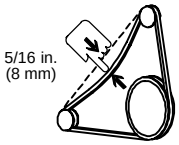
Check air cleaner hoses for cracks and loose clamps.



Clean and tighten battery connections.

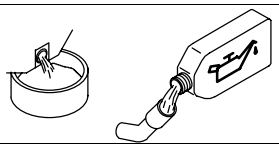


Check belt tension.

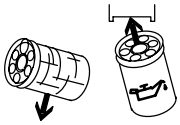


200 h

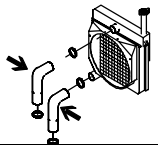
Change oil. See Section 7-5 and maintenance label.



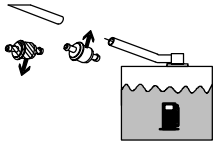
Change oil filter. See Section 7-5 and maintenance label.



Check radiator hoses and clamps.



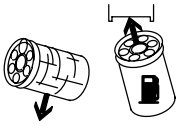
Replace primary fuel filter. See Section 7-5.



Replace unreadable labels.

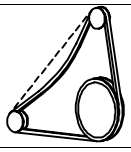
400 h

Replace secondary fuel filter. See Section 7-5.

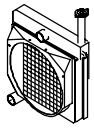


500 h

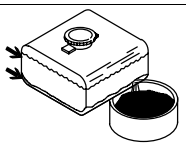
Replace fan belt.



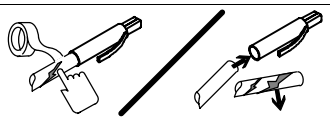
Flush radiator.



Drain sludge from fuel tank.

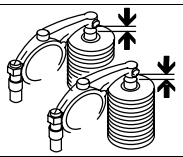


Repair or replace cracked cables.



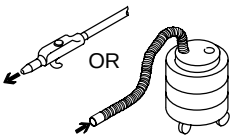
800 h

Check valve clearance.*

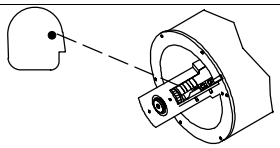


1000 h

Blow out or vacuum inside. During heavy service, clean monthly.

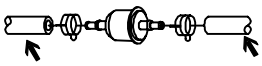


Service welding generator brushes and slip rings. Service more often in dirty conditions.*

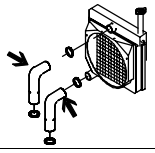


2000 h

Replace fuel lines and clamps. See Section 7-5.

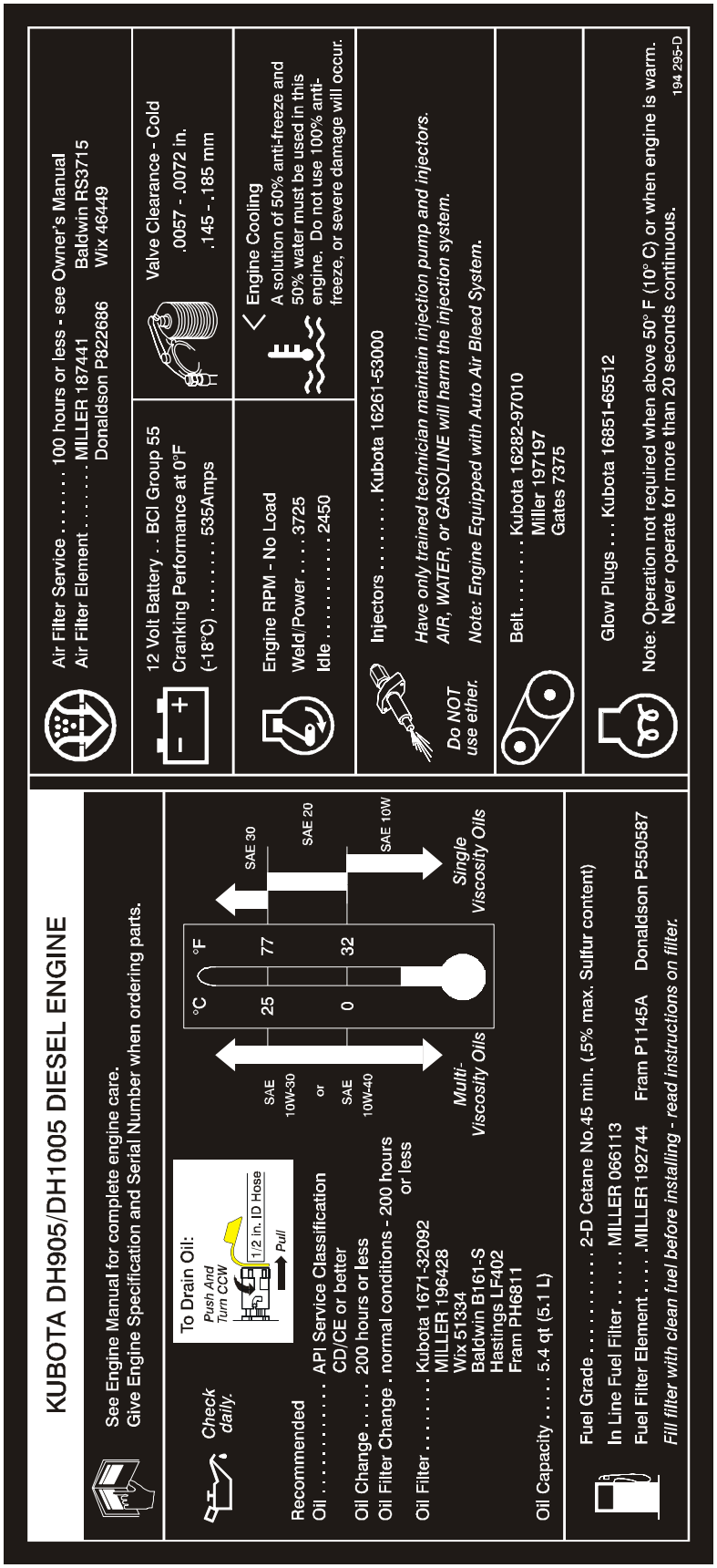


Replace radiator coolant and hoses. See Section 7-6.

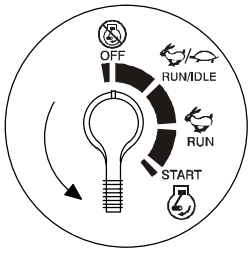


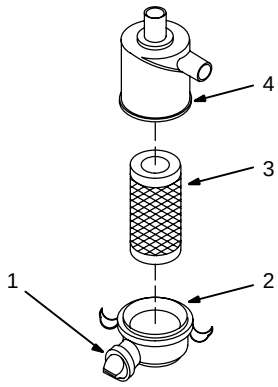
Notes

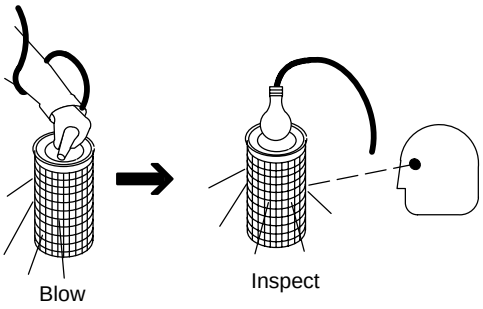
7-2. Maintenance Label


KUBOTA DH905/DH1005 DIESEL ENGINE
See Engine Manual for complete engine care.
Give Engine Specification and Serial Number when ordering parts.
Check daily.
To Drain Oil:
Push And Turn CCW
1/2 in. ID Hose
Pull
Recommended
Oil . . . . . API Service Classification CD/CE or better
Oil Change . . . . . 200 hours or less
Oil Filter Change . normal conditions - 200 hours or less
Oil Filter . . . . . Kubota 1671-32092
MILLER 196428
Wix 51334
Baldwin B161-S
Hastings LF402
Fram PH6811
Oil Capacity . . . . . 5.4 qt (5.1 L)
°C
°F
25
77
0
32
SAE 10W-30
or
SAE 10W-40
SAE 30
SAE 20
SAE 10W
Multi-Viscosity Oils
Single Viscosity Oils
Fuel Grade . . . . . 2-D Cetane No.45 min. (.5% max. Sulfur content)
In Line Fuel Filter . . . . . MILLER 066113
Fuel Filter Element . . . . MILLER 192744 Fram P1145A Donaldson P550587
Fill filter with clean fuel before installing - read instructions on filter.
Air Filter Service . . . . . 100 hours or less - see Owner's Manual
Air Filter Element . . . . . MILLER 187441 Baldwin RS3715
Donaldson P822686 Wix 46449
12 Volt Battery . . BCI Group 55
Cranking Performance at 0°F
(-18°C) 535Amps
Valve Clearance - Cold
.0057 - .0072 in.
.145 - .185 mm
Engine RPM - No Load
Weld/Power 3725
Idle 2450
Engine Cooling
A solution of 50% anti-freeze and 50% water must be used in this engine. Do not use 100% anti-freeze, or severe damage will occur.
Injectors . . . . . Kubota 16261-53000
Have only trained technician maintain injection pump and injectors.
AIR, WATER, or GASOLINE will harm the injection system.
Do NOT use ether.
Note: Engine Equipped with Auto Air Bleed System.
Belt. . . . . Kubota 16282-97010
Miller 197197
Gates 7375
Glow Plugs . . . Kubota 16851-65512
Note: Operation not required when above 50° F (10° C) or when engine is warm.
Never operate for more than 20 seconds continuous.
194 295-D

7-3. Servicing Air Cleaner







▲ **Stop engine.**

▲ **Do not run engine without air cleaner or with dirty element.**

1 Evacuator Valve

2 Dust Cap

3 Element

4 Housing

Open evacuator valve weekly to remove dust. Clean or replace element if dirty or damaged. Replace element yearly or after six cleanings.

To Clean air filter:

Wipe off cap and housing. Remove cap and dump out dust. Wipe dust from inside cap and housing with damp cloth. Remove element and reinstall cap.

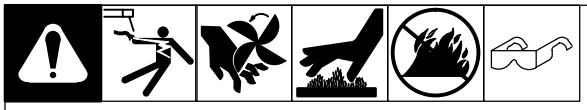
▲ **Do not clean housing with air hose.**

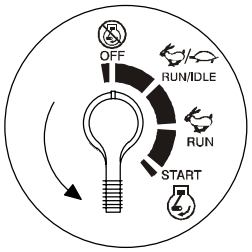
Clean element with compressed air. Max. air pressure: 100 psi (690 kPa). Replace element if it has holes or damaged gaskets.

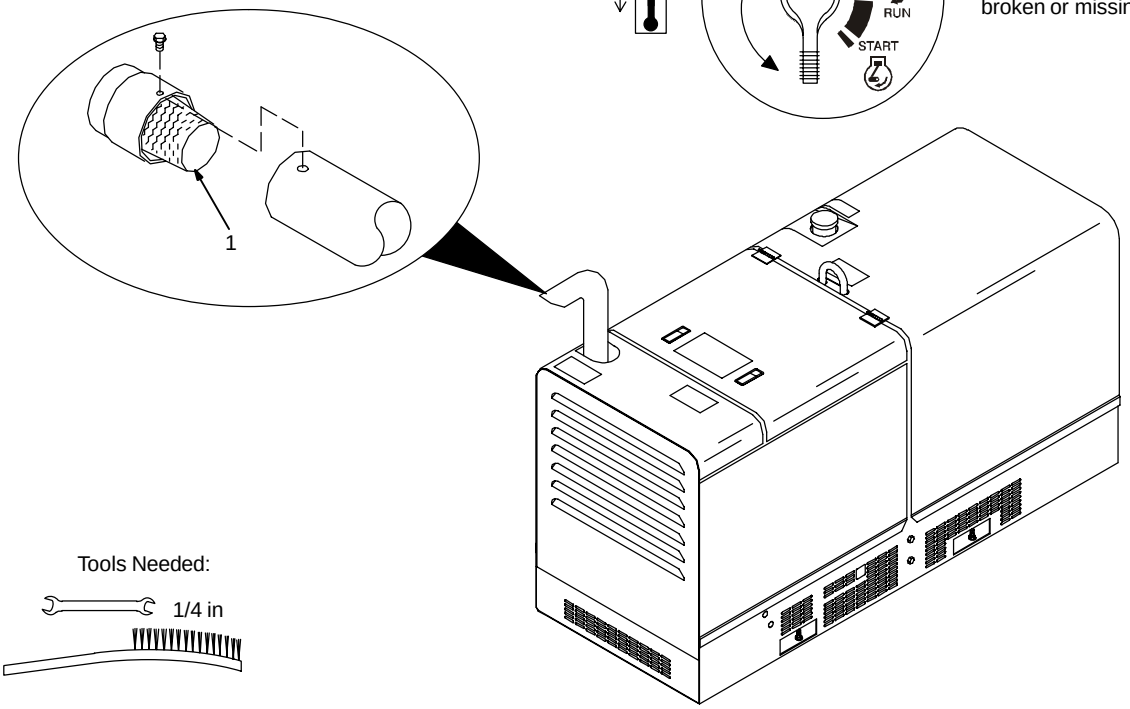
Reinstall element and cap

Ref. 189 438-A / 801 964

7-4. Servicing Optional Spark Arrestor







Tools Needed:

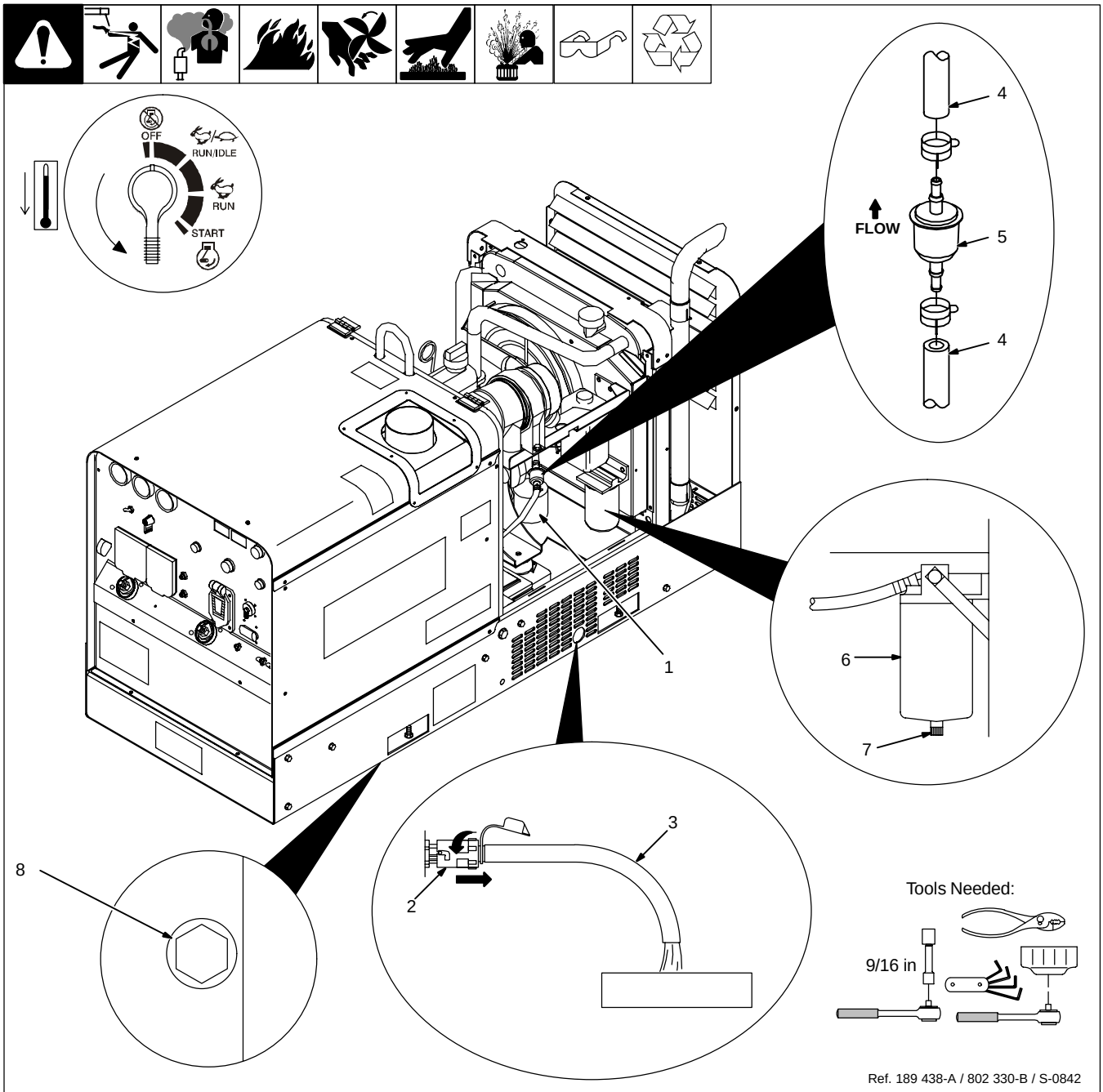
▲ **Stop engine and let cool.**

1 Spark Arrestor Screen

Clean and inspect screen. Replace spark arrestor if screen wires are broken or missing.

Ref. 189 438-B / 802 175-D

7-5. Servicing Engine Lubrication And Fuel Systems



Ref. 189 438-A / 802 330-B / S-0842

▲ **Stop engine and let cool.**

1 Oil Filter
2 Oil Drain Valve
3 1/2 ID x 12 in Hose
4 Fuel Line
5 Primary Fuel Filter
6 Secondary Fuel Filter
7 Petcock
8 Fuel Tank Sludge Drain

To change oil and filter:

Pull oil drain hose through access hole in base. Change engine oil and filter according to instructions in engine manual.

▲ **Close valve and valve cap before adding oil and running engine.**

Fill crankcase with new oil to full mark on dipstick (see Section 4-2).

To drain water from fuel system:

Open secondary fuel filter petcock and drain water into metal container. Close petcock when water-free fuel flows.

To change fuel filters:

Install new primary fuel filter as shown.

Replace secondary fuel filter according to engine manual.

Replace fuel lines if cracked or worn.

Wipe up any spilled fuel.

▲ **After servicing, start engine and check for fuel leaks.**

Stop engine, tighten connections as necessary, and wipe up fuel.

To change coolant:

Change coolant according to engine manual.

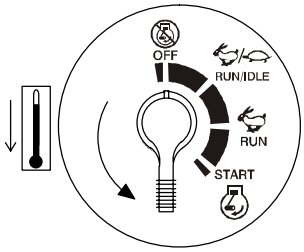
Run engine until engine reaches normal operating temperature. Loosen air bleed screw to remove air from cooling system. Tighten screw.

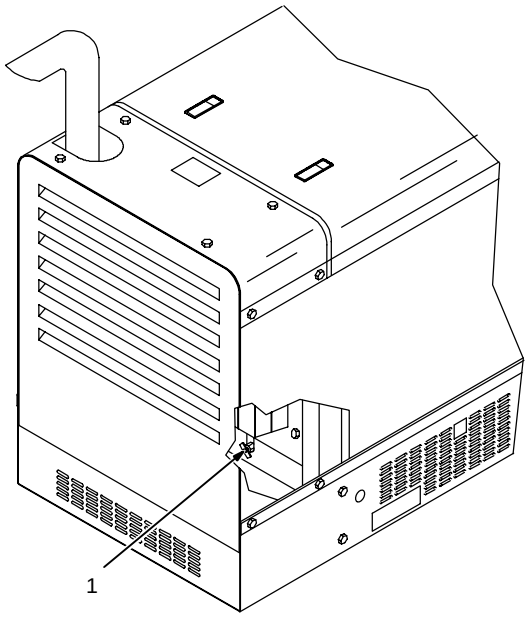
Check coolant level in recovery tank. Add coolant if necessary.

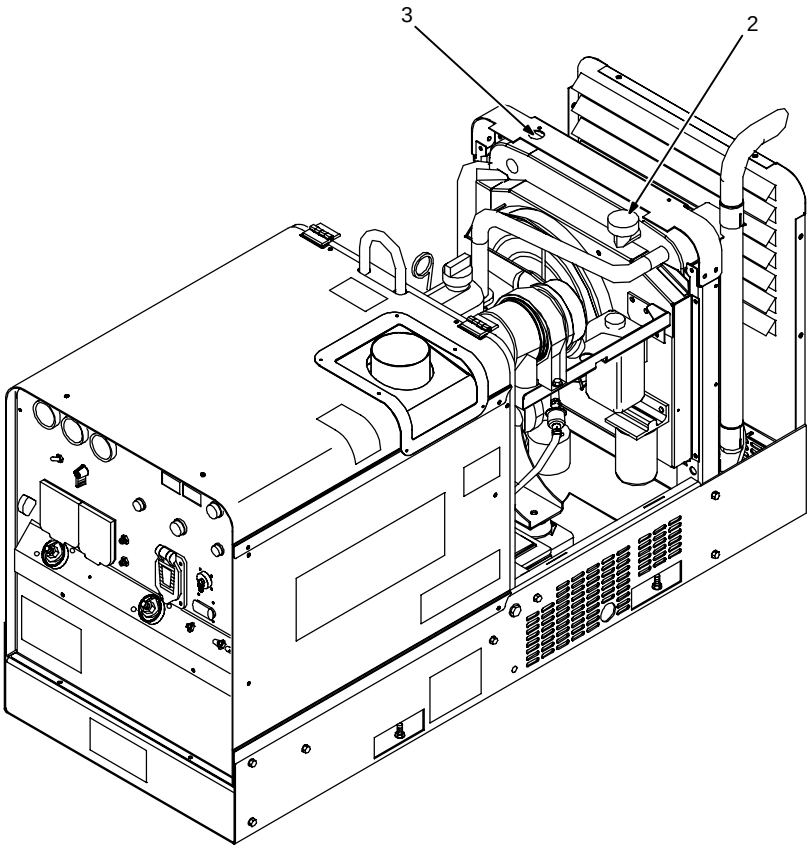
To drain sludge from fuel tank:

Put metal container under drain, and remove sludge drain plug. Reinstall plug when done.

7-6. Servicing Engine Cooling System







▲ **Stop engine and let cool.**

1 Radiator Draincock

2 Radiator Cap

3 Radiator Air Bleed Screw

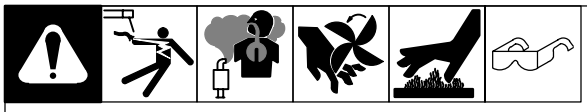
Change coolant according to engine manual. Add coolant according to Section 4-3).

Run engine until engine reaches normal operating temperature. Loosen air bleed screw to remove air from cooling system. Tighten screw.

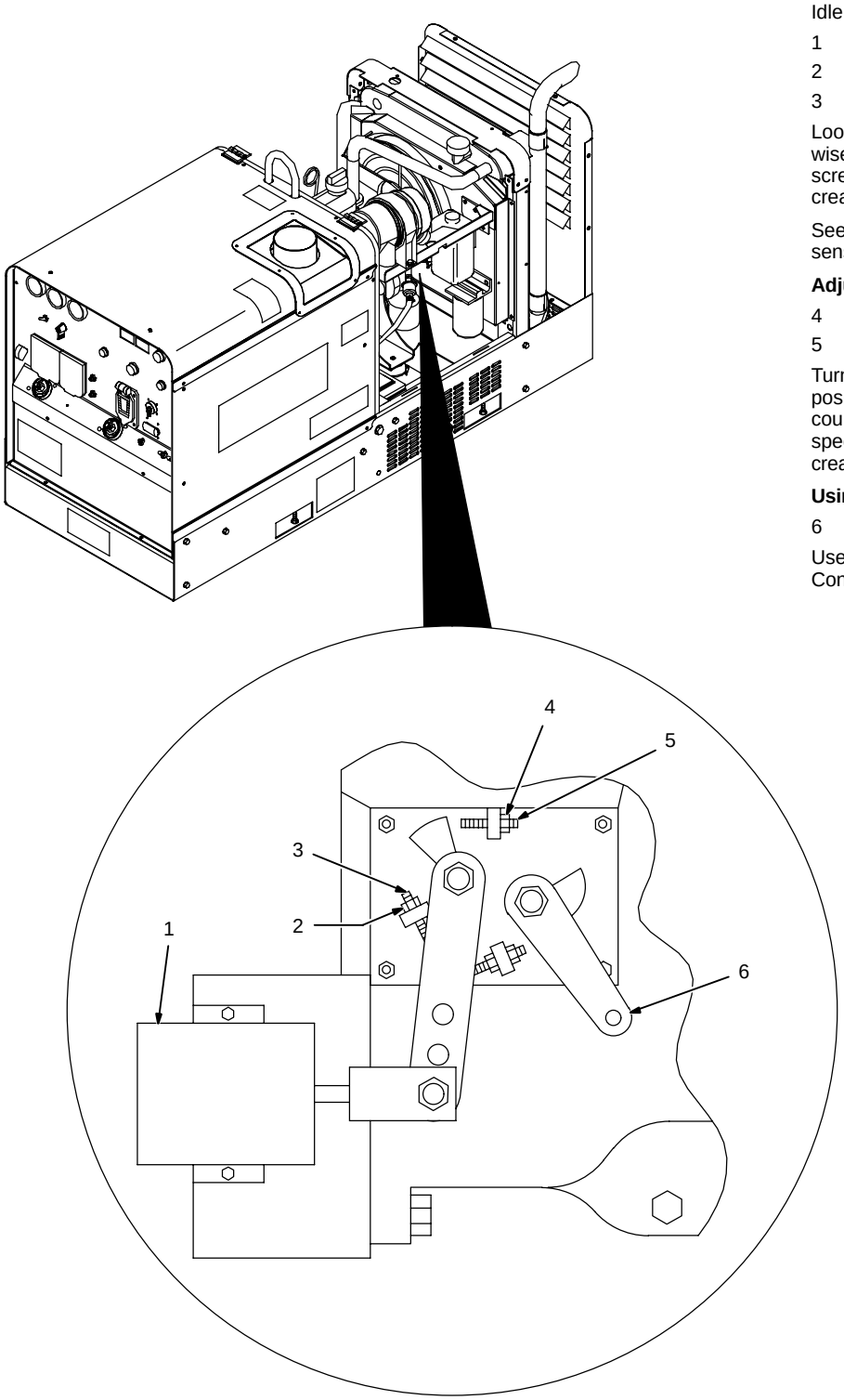
Check coolant level in recovery tank. Add coolant if necessary

802 330-B / 802 581

7-7. Adjusting Engine Speed



	2450 ± 100 rpm
	3750 Max



After tuning engine, check engine speeds with a tachometer (see table). If necessary, adjust speeds as follows:

Start engine and run until warm. Turn V/A control to max.

Adjusting Idle Speed

Turn Engine Control switch to Run/Idle position.

1 Throttle Solenoid

2 Idle Speed Jam Nut

3 Idle Speed Screw

Loosen nut and turn screw clockwise to increase idle speed. Turn screw counterclockwise to decrease idle speed. Tighten nut.

See engine manual for governor sensitivity adjustment.

Adjusting Weld/Power Speed

4 Weld Speed Jam Nut

5 Adjustment Screw

Turn Engine Control switch to Run position. Loosen nut and turn screw counterclockwise to increase speed. Turn screw clockwise to decrease speed. Tighten nut.

Using Engine Stop Lever

6 Engine Stop Lever

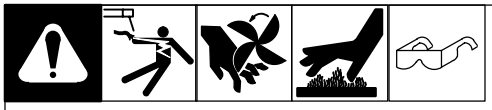
Use lever to stop engine if Engine Control switch does not work.

Tools Needed:

10 mm

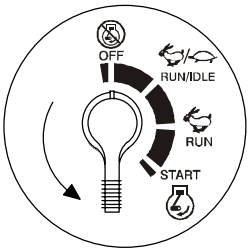
802 330-B

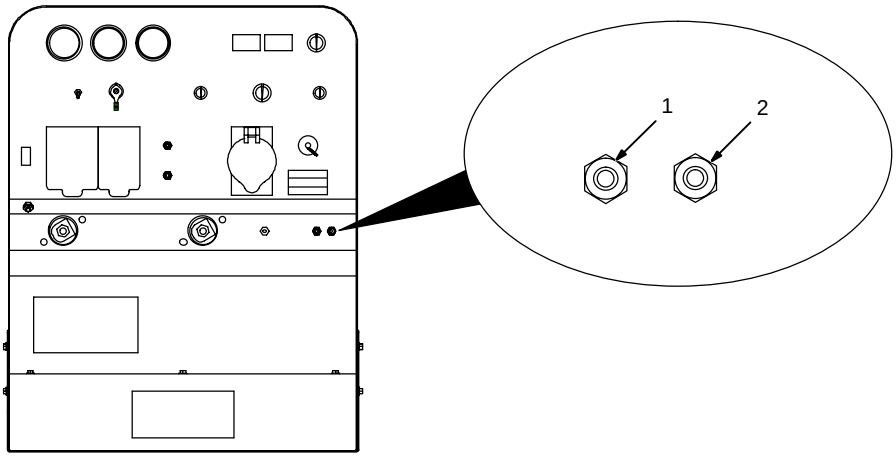
7-8. Overload Protection

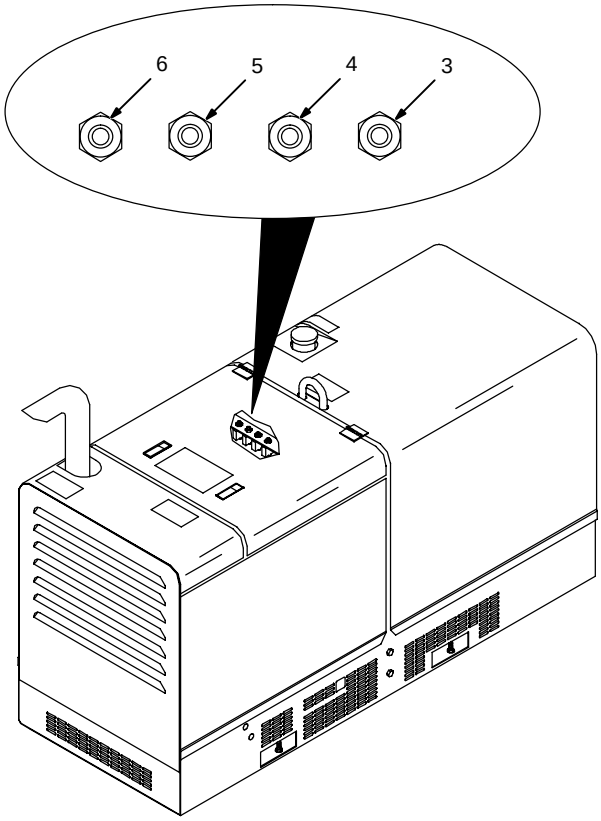


Tools Needed:

3/8 in







▲ **Stop engine.**

☞ *When a circuit breaker opens, it usually indicates a more serious problem exists. Contact Factory Authorized Service Agent.*

1 Circuit Breaker CB12

CB12 protects the 115 volt ac output to Remote 14 receptacle RC5. If CB12 opens, 115 volt ac output to RC5 stops.

2 Circuit Breaker CB11

CB11 protects the 24 volt ac output to Remote 14 receptacle RC5. If CB11 opens, 24 volt ac output to RC5 stops.

Press button to reset breaker.

3 Circuit Breaker CB7

4 Circuit Breaker CB8

5 Circuit Breaker CB9

6 Circuit Breaker CB10

CB7 protects the engine glow plug from overload. If CB7 opens, the glow plug does not work and engine may not start in cold weather. Check continuity and connections of engine glow plug.

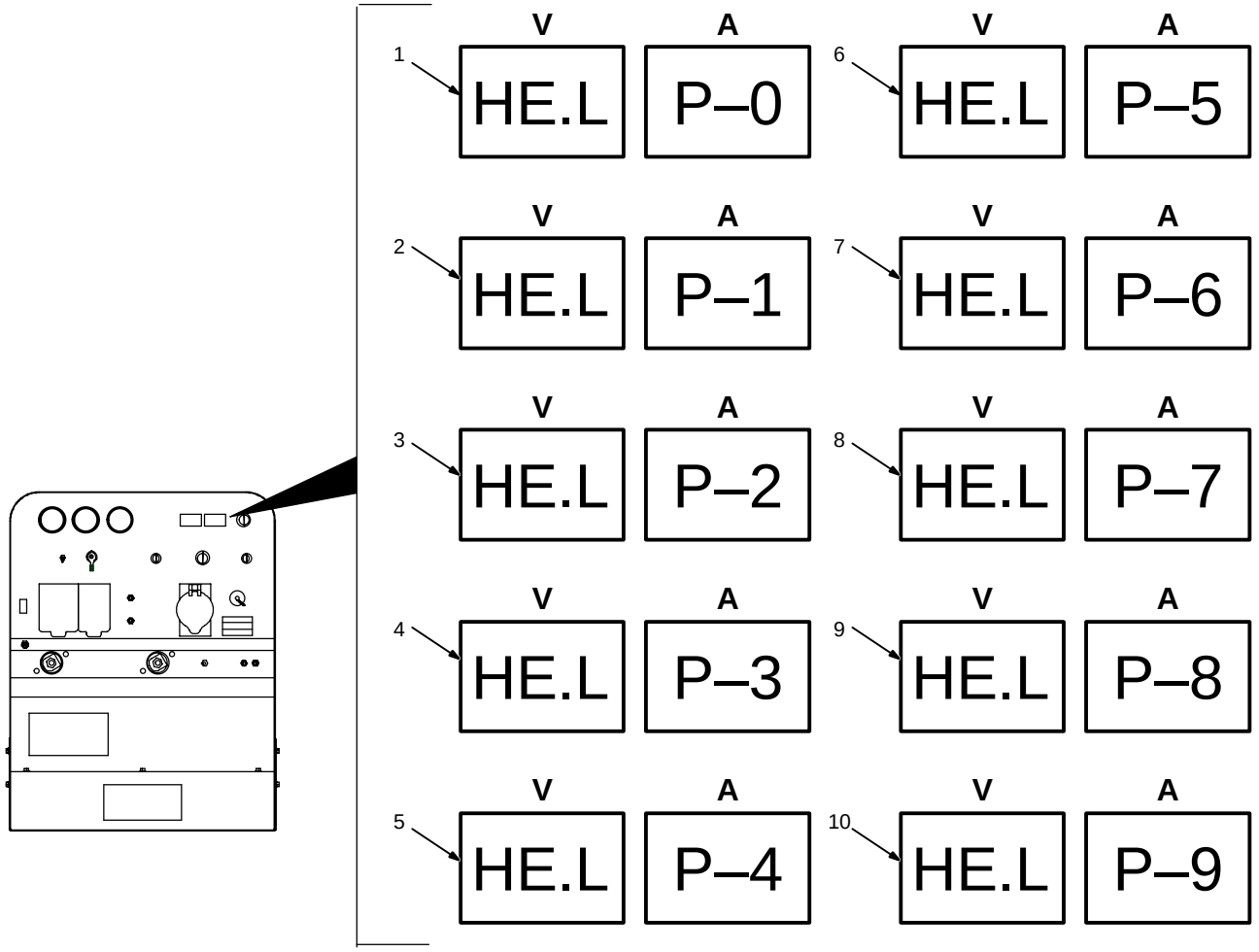
CB8 protects the engine wiring system from overload. If CB8 opens, the engine will not crank. Check battery, starter, and engine control switch.

CB9 protects the engine throttle solenoid from overload. If CB9 opens, the engine will not run at idle speed. Check throttle solenoid TS1 for obstructions.

CB10 protects the engine fuel solenoid from overload. If CB10 opens, the engine cranks but does not start. Check fuel solenoid FS1 for obstructions.

Ref. 189 438-B / 802 174-E / 802 175-D

7-9. Voltmeter/Ammeter Help Displays



802 174-E

Use the voltmeter/ammeter help displays to help determine the cause of no weld output. When a help display is shown, the inverter module weld output has stopped but the engine continues to run. Correct the problem before resuming operation.

The display screen resets when the fault is corrected.

☞ *All directions are in reference to the front of the unit. All circuitry referred to is located inside the inverter module.*

1 Help 0 Display

Indicates a shorted thermistor RT2 on the left side of the unit. If this display is shown, contact a Factory Authorized Service Agent.

2 Help 1 Display

Indicates a malfunction in the primary power circuit possibly caused by applying a high weld load at idle speed. Turn Engine Control switch to Run position. If problem continues, contact a Factory Authorized Service Agent.

3 Help 2 Display

Indicates a malfunction in the thermal protection circuitry located on the left side of the unit. If this display is shown, contact a Factory Authorized Service Agent.

4 Help 3 Display

Indicates the left side of the unit has overheated. The unit has shut down to allow the fan to cool it (see Section 3-3). Operation will continue when the unit has cooled.

5 Help 4 Display

Indicates a malfunction in the thermal protection circuitry located on the right side of the unit. If this display is shown, contact a Factory Authorized Service Agent.

6 Help 5 Display

Indicates the right side of the unit has overheated. The unit has shut down to allow the fan to cool it (see Section 3-3). Operation will continue when the unit has cooled.

7 Help 6 Display

Indicates that the input voltage is too low and the unit has automatically shut down. Operation will continue when the voltage is within the acceptable lower range limit (15% below the applicable input voltage). If this display is shown, have a Factory Authorized Service Agent check the power generator output voltage.

8 Help 7 Display

Indicates that the input voltage is too high and the unit has automatically shut down. Operation will continue when the voltage is within the acceptable upper range limit (15% above the applicable input voltage). If this display is shown, have a Factory Authorized Service Agent check the power generator output voltage.

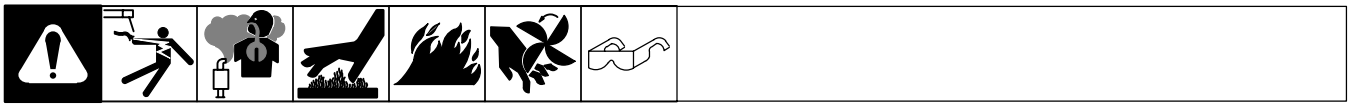
9 Help 8 Display

Indicates a malfunction in the secondary power circuit of the unit. If this display is shown, contact a Factory Authorized Service Agent.

10 Help 9 Display

Indicates a shorted thermistor RT1 on the right side of the unit. If this display is shown, contact a Factory Authorized Service Agent.

7-10. Troubleshooting



A. Welding

Trouble	Remedy
No weld output.	Check control settings.
	Check weld connections.
	Disconnect equipment from auxiliary power receptacles during start-up.
	Have Factory Authorized Service Agent check brushes, slip rings, voltage regulator board PC8, interconnecting board PC2, and control board PC1.
	If using remote control, be sure mode switch is in a position that provides output control at Remote 14 receptacle (see Sections 4-8 and 5-1).
	Check, repair, or replace remote control.
	Unit overheated. Allow unit to run so fan cools unit (see Section 3-3).
Ammeter and voltmeter do not work after unit has run out of fuel.	Restart the engine.
Low weld output.	Check control settings.
	Place V/A Control switch in Panel position, or move switch to Remote position and connect remote amperage/voltage control to Remote 14 receptacle RC5 (see Section 4-8).
	Check and clean air cleaner as necessary (see Section 7-3).
	Check engine speed, and adjust if necessary (see Section 7-7).
	If using remote control, be sure mode switch is in a position that provides output control at Remote 14 receptacle RC5 (see Sections 4-8 and 5-1).
	Have Factory Authorized Service Agent check brushes, slip rings, voltage regulator board PC8, interconnecting board PC2, and control board PC1.
	See engine manual.
High weld output.	Check control settings.
	Check engine speed, and adjust if necessary (see Section 7-7).
	Check for obstructed movement of throttle solenoid linkage.
	Have Factory Authorized Service Agent check voltage regulator board PC8 and control board PC1.
Weld output cannot be adjusted.	Check position of V/A Control switch (see Section 5-1).
	Have Factory Authorized Service Agent check voltage regulator board PC8 and control board PC1.
Erratic weld output.	Check control settings.
	Clean and tighten connections both inside and outside unit.
	Check and secure lead connections to A/V control.
	Be sure connection to work piece is clean and tight.
	Remove excessive coils from weld cables.
	Use dry, properly stored electrodes.
	Check engine speed, and adjust if necessary (see Section 7-7).
	Have Factory Authorized Service Agent check brushes, slip rings, voltage regulator board PC8, interconnecting board PC2, and control board PC1.

Trouble	Remedy
Remote contactor control does not activate contactor.	Check and tighten connections to Remote 14 receptacle RC5 (see Section 4-8).
Lack of high frequency; difficulty in establishing Gas Tungsten Arc Welding arc.	Use proper size tungsten for welding amperage.
	Reduce leakage of high frequency from torch or work cable (check grounding, remove excessive coils from weld cables, use shorter weld cables, etc.).
	Check cables and torch for cracked or deteriorated insulation or bad connections. Repair or replace necessary parts.
Wandering arc – poor control of arc direction.	Reduce gas flow rate.
	Select proper size tungsten. Properly prepare tungsten.
Tungsten electrode oxidizing and not remaining bright after conclusion of weld.	Shield weld zone from drafts.
	Increase postflow time.
	Check and tighten all gas fittings.
	Properly prepare tungsten.
No 115 volts ac output at Remote 14 receptacle RC5.	Reset circuit breaker CB12 (see Section 7-8).
No 24 volts ac output at Remote 14 receptacle RC5.	Reset circuit breaker CB11 (see Section 7-8).

B. Auxiliary Power

Trouble	Remedy
No power output.	Reset circuit breakers (see Section 6-1).
	Have Factory Authorized Service Agent check brushes, slip rings, voltage regulator board PC8, interconnecting board PC2, and control board PC1.
Low power output.	Check air cleaner, and clean or replace element if necessary.
	Check engine speed, and adjust if necessary (see Section 7-7).
	See engine manual.
High power output.	Check engine speed, and adjust if necessary (see Section 7-7).
Erratic power output.	Check receptacle wiring and connections.
	Check governor according to engine manual.
	Have Factory Authorized Service Agent check brushes, slip rings, voltage regulator board PC8, interconnecting board PC2, and control board PC1.

C. Engine

Trouble	Remedy
Engine will not crank.	Reset circuit breaker CB8 (see Section 7-8).
	Check battery voltage.
	Check battery connections and tighten if necessary.
	Have Factory Authorized Service Agent check Engine Control switch S1.
Engine cranks, but does not start.	Check fuel level (see Section 4-2).
	Open fuel valve (see Section 4-2).
	Check oil level (see Section 4-2). Engine will not start if oil pressure is low.
	Reset circuit breaker CB10 (see Section 7-8).
	Check coolant level and fan belt (see Section 4-2 and engine manual). Engine will not start if coolant temperature is high.
	Use Glow Plug switch if unit does not start in cold weather. If unit still does not start, reset circuit breaker CB7 (see Section 7-8).
	Service primary and secondary fuel filters (see Section 7-5).
	Check battery and replace if necessary.
	Check engine charging system according to engine manual.
	Bleed air from fuel system according to engine manual.
	Have Factory Authorized Service Agent check low oil pressure switch S2, engine coolant temperature switch S3, and control relay CR1.
	See engine manual.
Engine starts but stops when Engine Control switch returns to Run position.	Check oil level (see Section 4-2). Engine will not start if oil pressure is too low.
	Reset circuit breaker CB10 (see Section 7-8).
	Check coolant level and fan belt (see Section 4-2 and engine manual). Engine will not start if engine temperature is too high.
	Check and refill crankcase with proper viscosity oil for operating temperature, if necessary (see engine manual).
	Have Factory Authorized Service Agent check low oil pressure switch S2 and engine coolant temperature switch S3.
Engine does not stop.	Stop engine by pushing down engine stop lever (see Section 4-2) or closing fuel valve (see Section 4-2). After stopping engine, adjust fuel solenoid linkage (see engine manual).
Engine stopped during normal operation.	Check fuel level (see Section 4-2).
	Open fuel valve (see Section 4-2).
	Check oil level (see Section 4-2). Engine stops if oil pressure is too low.
	Check coolant level and fan belt (see Section 4-2 and engine manual). Engine stops if engine temperature is too high.
	Bleed air from fuel system according to engine manual.
	Have Factory Authorized Service Agent check low oil pressure switch S2 and engine coolant temperature switch S3.
Battery discharges between uses.	Clean top of battery with baking soda and water solution; rinse with clear water.
	Periodically recharge battery (approximately every 3 months).
	Replace battery.
	Check voltage regulator according to engine manual.

Trouble	Remedy
Engine does not go to low (idle) speed with Engine Control switch in Run/Idle position.	Be sure Engine Control switch S1 is in Run/Idle position.
	Remove all weld and auxiliary power loads.
	Turn off remote device connected to Remote 14 receptacle RC5 (see Section 4-8).
	Check for obstructed movement of throttle solenoid linkage.
	Have Factory Authorized Service Agent check voltage regulator board PC8 and current transformer CT1.
	Reset circuit breaker CB9 (see Section 7-8).
Engine does not go to high (run) speed when auxiliary power or large weld load is applied with Engine Control switch in Run/Idle position.	Place Engine Control switch in the Run position. Have Factory Authorized Service Agent check unit.
Engine uses oil during run-in period; wetstacking occurs.	Dry engine (see Section 9 and engine manual).
Coolant recovery tank continuously overflows.	Bleed air from radiator, and replace lost coolant (see Section 4-3).

Notes

Notes

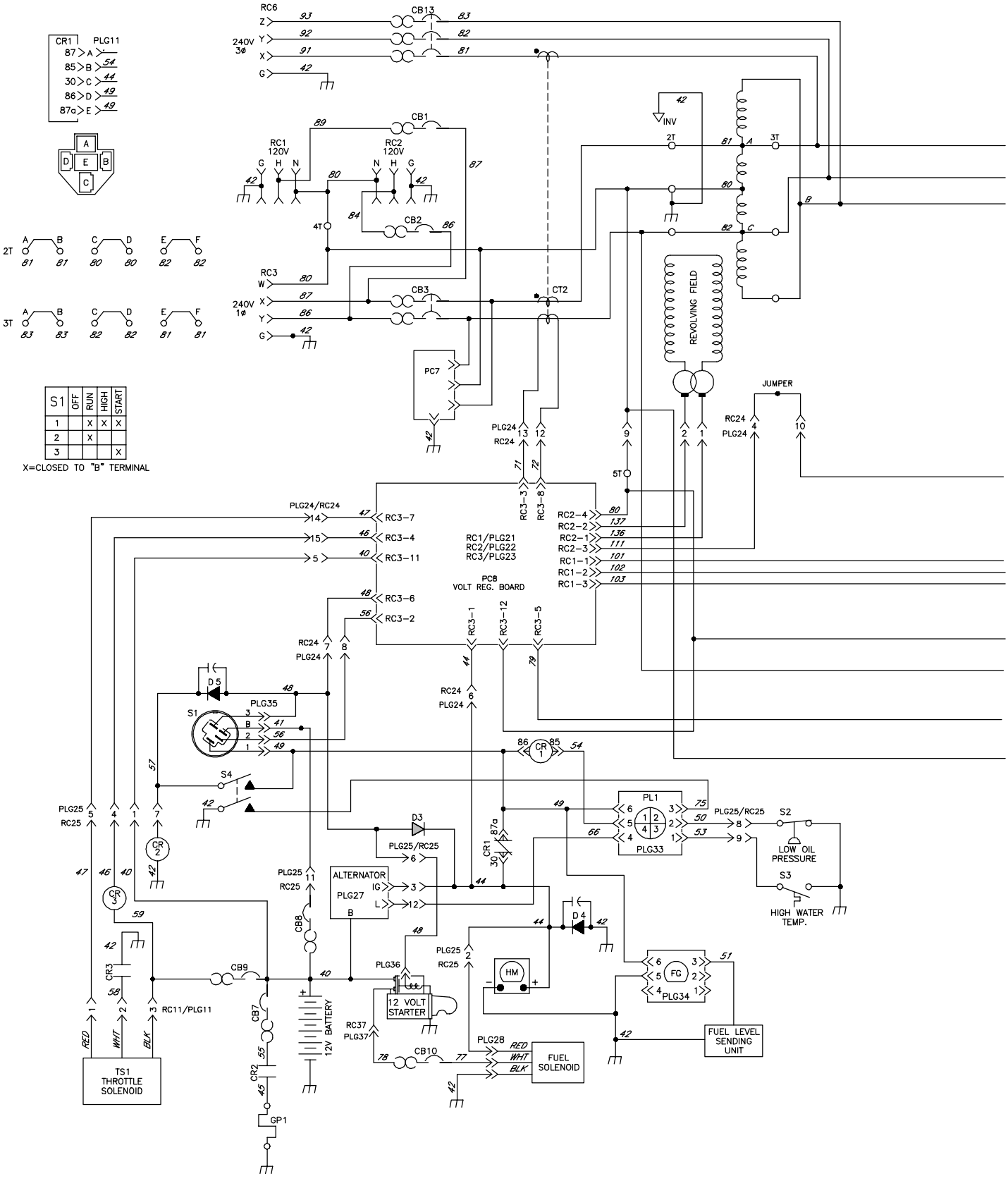
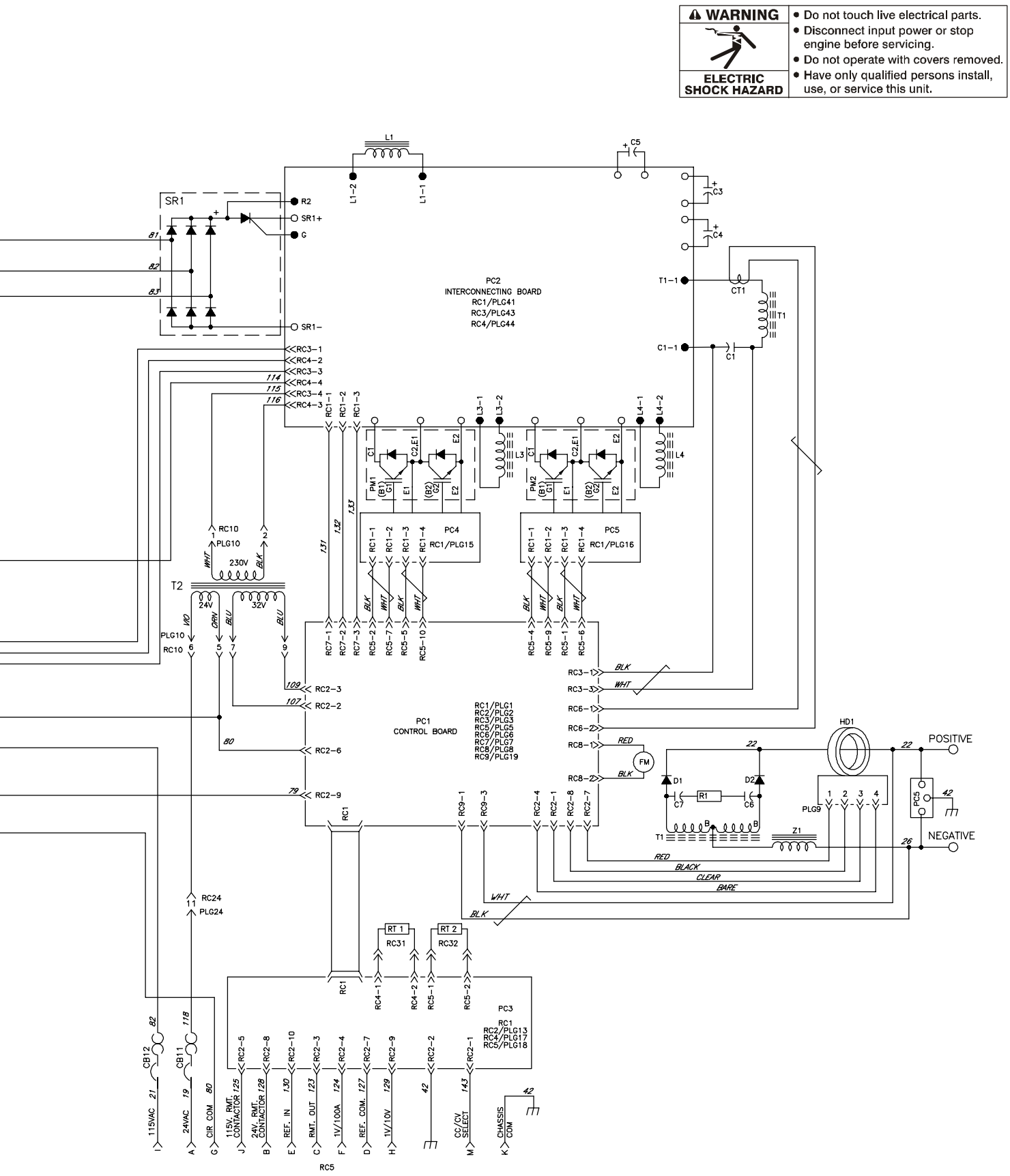
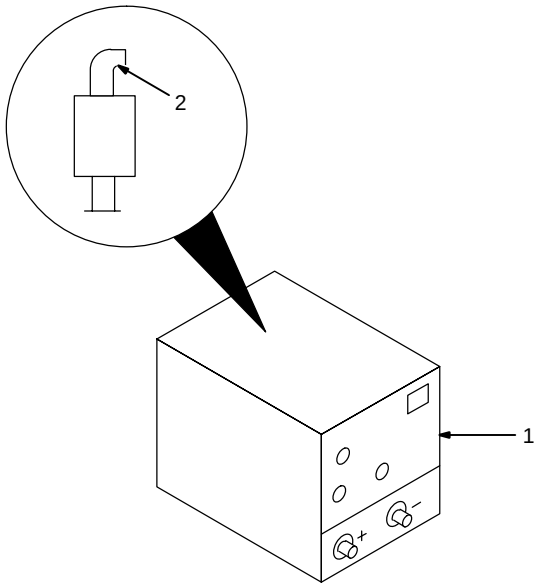


Figure 8-2. Circuit Diagram For Welding Generator


WARNING
• Do not touch live electrical parts.
• Disconnect input power or stop engine before servicing.
• Do not operate with covers removed.
• Have only qualified persons install, use, or service this unit.
ELECTRIC SHOCK HAZARD
L1
C5
SR1
R2
SR1+
G
SR1−
L1-2
L1-1
C3
C4
PC2
INTERCONNECTING BOARD
RC1/PLG41
RC3/PLG43
RC4/PLG44
T1-1
CT1
T1
C1-1
C1
RC3-1
RC4-2
RC3-3
RC4-4
RC3-4
RC4-3
RC1-1
RC1-2
RC1-3
L3-1
L3-2
L4-1
L4-2
L3
L4
PC4
RC1/PLG15
PC5
RC1/PLG16
RC10
PLG10
230V
T2
24V
32V
PLG10
RC10
RC7-1
RC7-2
RC7-3
RC5-2
RC5-7
RC5-5
RC5-10
RC5-4
RC5-9
RC5-1
RC5-6
RC3-1
RC3-3
RC6-1
RC6-2
RC8-1
RC8-2
RC2-3
RC2-2
RC2-6
RC2-9
PC1
CONTROL BOARD
RC1/PLG1
RC2/PLG2
RC3/PLG3
RC5/PLG5
RC6/PLG6
RC7/PLG7
RC8/PLG8
RC9/PLG19
FM
HD1
POSITIVE
NEGATIVE
D1
D2
R1
C7
C6
PLG9
PC5
Z1
RED
BLACK
CLEAR
BARE
WHT
BLK
RC24
PLG24
RT 1
RC31
RT 2
RC32
RC1
RC9-1
RC9-3
RC2-4
RC2-1
RC2-8
RC2-7
RC4-1
RC4-2
RC5-1
RC5-2
PC3
RC1
RC2/PLG13
RC4/PLG17
RC5/PLG18
CB12
CB11
115VAC
24VAC
CIR COM
115V. RMT. CONTACTOR
24V. RMT. CONTACTOR
REF. IN
RMT. OUT
1V/100A
REF. COM.
1V/10V
CC/CV SELECT
CHASSIS COM
RC5

SECTION 9 – RUN-IN PROCEDURE

9-1. Wetstacking



1 Welding Generator

Run diesel engines near rated output during run-in period to properly seat piston rings and prevent wetstacking. See nameplate or rating label to find rated output.

☞ *Do not idle engine longer than necessary. Piston rings seat faster if engine runs at weld/ power rpm, and the welding generator is kept loaded during run-in.*

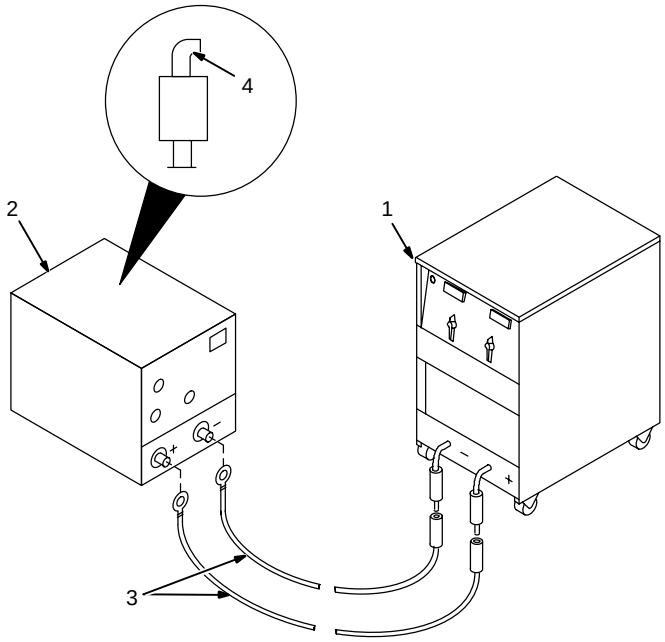
2 Engine Exhaust Pipe

Wetstacking is unburned fuel and oil in the exhaust pipe and occurs during run-in if the engine is run too long at light load or idle rpm.

If exhaust pipe is coated with a wet, black, tar-like substance, dry the engine using one of the following run-in procedures.

See the engine manual for additional engine run-in information.

9-2. Run-In Procedure Using Load Bank



▲ **Stop engine.**

▲ **Do not touch hot exhaust pipe, engine parts, or load bank/grid.**

▲ **Keep exhaust and pipe away from flammables.**

1 Load Bank

Turn all load bank switches Off. If needed, connect load bank to 115 volts ac wall receptacle or generator auxiliary power receptacle.

2 Welding Generator

3 Weld Cables

Connect load bank to generator weld output terminals using proper size weld cables with correct connectors. Observe correct polarity.

Start engine and run for several minutes.

Set load bank switches and then adjust generator V/A control so load equals 225 amps at 30 volts.

Check generator and load bank meters after first five minutes then every fifteen minutes to be sure generator is loaded properly.

☞ *Check oil level frequently during run-in; add oil if needed.*

After one hour (minimum) place V/A control in minimum position, then turn off load bank to remove load. Run engine several minutes at no load.

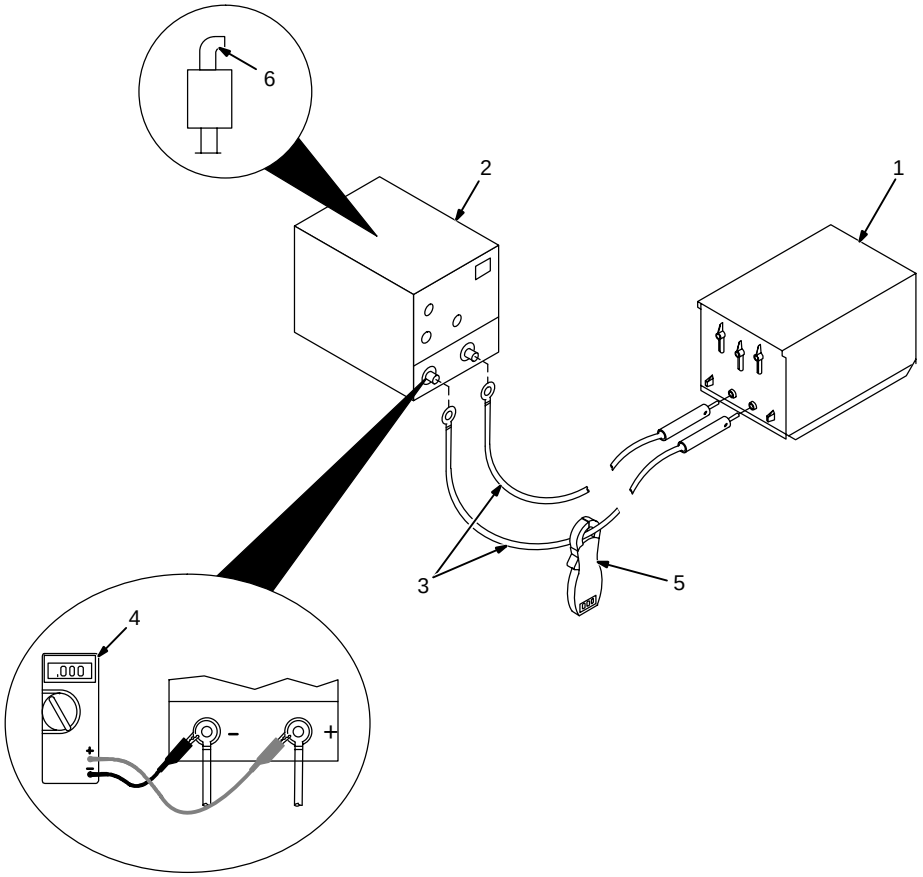
▲ **Stop engine and let cool.**

4 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

S-0683

9-3. Run-In Procedure Using Resistance Grid



▲ **Stop engine.**

▲ **Do not touch hot exhaust pipe, engine parts, or load bank/grid.**

▲ **Keep exhaust and pipe away from flammables.**

1 Resistance Grid

Use grid sized for generator rated output.

Turn Off grid.

2 Welding Generator

3 Weld Cables

Connect grid to generator weld output terminals using proper size weld cables with correct connectors (polarity is not important).

4 Voltmeter

5 Clamp-On Ammeter

Connect voltmeter and ammeter as shown, if not provided on generator.

Start engine and run for several minutes.

Set grid switches and then adjust generator V/A control so load equals 225 amps at 30 volts.

Check generator and meters after first five minutes then every fifteen minutes to be sure generator is loaded properly.

☞ *Check oil level frequently during run-in; add oil if needed.*

After one hour (minimum), place V/A control in minimum position, then shut down grid to remove load. Run engine several minutes at no load.

▲ **Stop engine and let cool.**

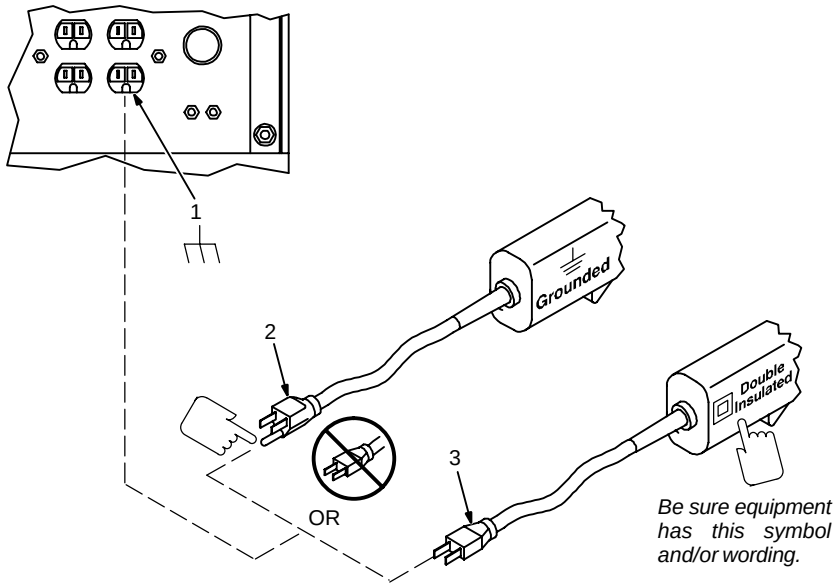
6 Engine Exhaust Pipe

Repeat procedure if wetstacking is present.

S-0684

SECTION 10 – AUXILIARY POWER GUIDELINES

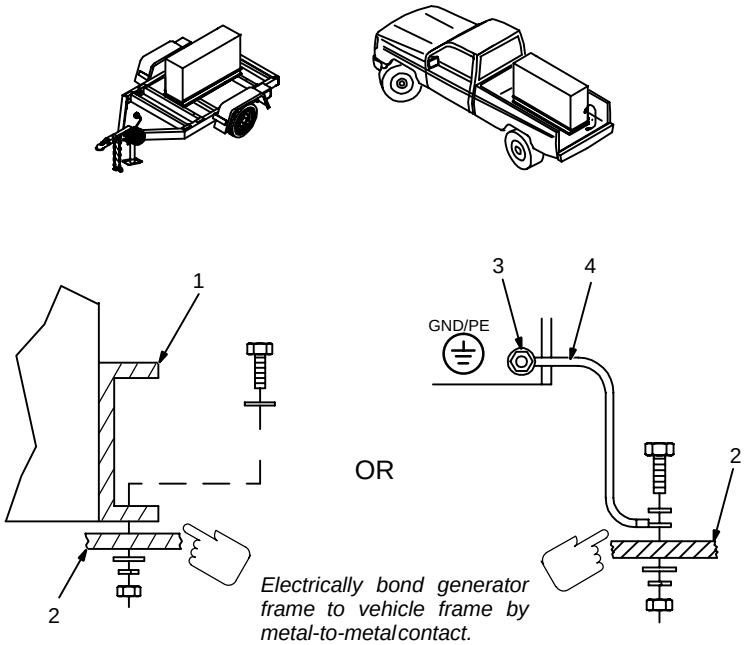
10-1. Selecting Equipment



1 Auxiliary Power Receptacles – Neutral Bonded To Frame
2 3-Prong Plug From Case Grounded Equipment
3 2-Prong Plug From Double Insulated Equipment

aux_pwr 2/99 – Ref. ST-159 730 / ST-800 577

10-2. Grounding Generator To Truck Or Trailer Frame



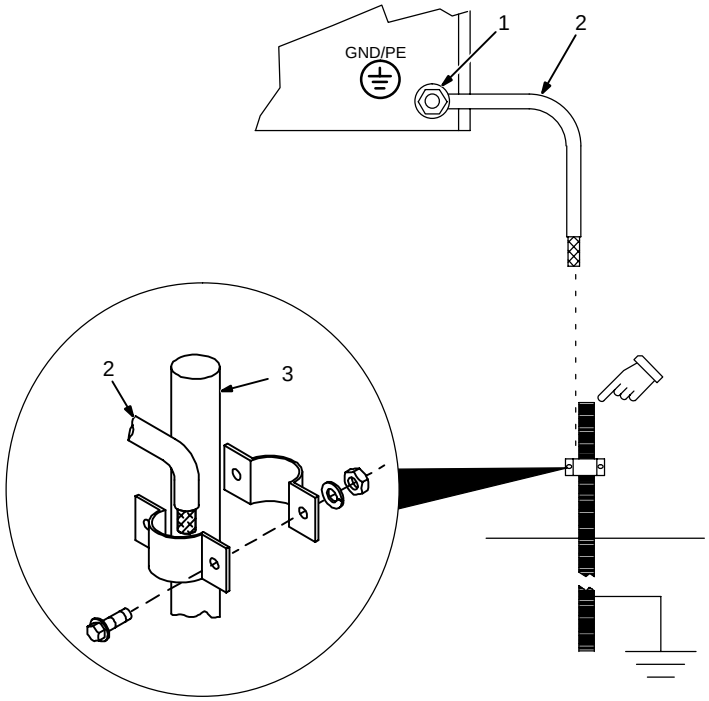
1 Generator Base
2 Metal Vehicle Frame
3 Equipment Grounding Terminal
4 Grounding Cable

Use #10 AWG or larger insulated copper wire.

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

S-0854

10-3. Grounding When Supplying Building Systems



1 Equipment Grounding Terminal

2 Grounding Cable

Use #10 AWG or larger insulated copper wire.

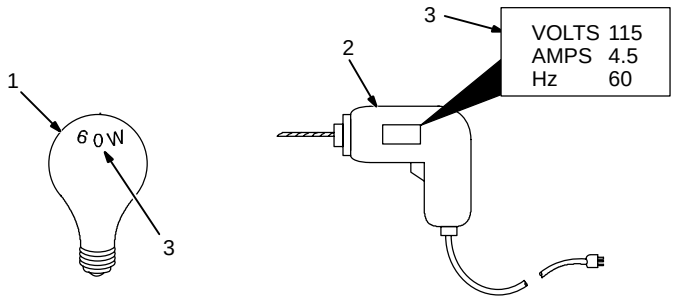
3 Ground Device

▲ **Ground generator to system earth ground if supplying power to a premises (home, shop, farm) wiring system.**

Use ground device as stated in electrical codes.

ST-800 576-B

10-4. How Much Power Does Equipment Require?



1 Resistive Load

A light bulb is a resistive load and requires a constant amount of power.

2 Non-Resistive Load

Equipment with a motor is a non-resistive load and requires approximately six times more power while starting the motor than when running (see Section 10-8).

3 Rating Data

Rating shows volts and amperes, or watts required to run equipment.

AMPERES x VOLTS = WATTS

EXAMPLE 1: If a drill uses 4.5 amperes at 115 volts, calculate its running power requirement in watts.

4.5 A x 115 V = 520 W

The load applied by the drill is 520 watts.

EXAMPLE 2: If three 200 watt flood lamps are used with the drill from Example 1, add the individual loads to calculate total load.

(200 W + 200 W + 200 W) + 520 W = 1120 W

The total load applied by the three flood lamps and drill is 1120 watts.

S-0623

10-5. Approximate Power Requirements For Industrial Motors

Industrial Motors	Rating	Starting Watts	Running Watts
Split Phase	1/8 HP	800	300
	1/6 HP	1225	500
	1/4 HP	1600	600
	1/3 HP	2100	700
	1/2 HP	3175	875
Capacitor Start-Induction Run	1/3 HP	2020	720
	1/2 HP	3075	975
	3/4 HP	4500	1400
	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
Capacitor Start-Capacitor Run	1-1/2 HP	8100	2000
	5 HP	23300	6000
	7-1/2 HP	35000	8000
	10 HP	46700	10700
Fan Duty	1/8 HP	1000	400
	1/6 HP	1400	550
	1/4 HP	1850	650
	1/3 HP	2400	800
	1/2 HP	3500	1100

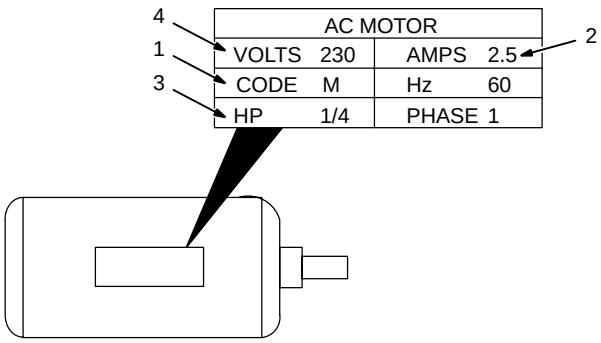
10-6. Approximate Power Requirements For Farm/Home Equipment

Farm/Home Equipment	Rating	Starting Watts	Running Watts
Stock Tank De-Icer		1000	1000
Grain Cleaner	1/4 HP	1650	650
Portable Conveyor	1/2 HP	3400	1000
Grain Elevator	3/4 HP	4400	1400
Milk Cooler		2900	1100
Milker (Vacuum Pump)	2 HP	10500	2800
FARM DUTY MOTORS	1/3 HP	1720	720
Std. (e.g. Conveyors,	1/2 HP	2575	975
Feed Augers, Air	3/4 HP	4500	1400
Compressors)	1 HP	6100	1600
	1-1/2 HP	8200	2200
	2 HP	10550	2850
	3 HP	15900	3900
	5 HP	23300	6800
High Torque (e.g. Barn	1-1/2 HP	8100	2000
Cleaners, Silo Unloaders,	5 HP	23300	6000
Silo Hoists, Bunk Feeders)	7-1/2 HP	35000	8000
	10 HP	46700	10700
3-1/2 cu. ft. Mixer	1/2 HP	3300	1000
High Pressure 1.8 Gal/Min	500 PSI	3150	950
Washer 2 gal/min	550 PSI	4500	1400
2 gal/min	700 PSI	6100	1600
Refrigerator or Freezer		3100	800
Shallow Well Pump	1/3 HP	2150	750
	1/2 HP	3100	1000
Sump Pump	1/3 HP	2100	800
	1/2 HP	3200	1050

10-7. Approximate Power Requirements For Contractor Equipment

Contractor	Rating	Starting Watts	Running Watts
Hand Drill	1/4 in	350	350
	3/8 in	400	400
	1/2 in	600	600
Circular Saw	6-1/2 in	500	500
	7-1/4 in	900	900
	8-1/4 in	1400	1400
Table Saw	9 in	4500	1500
	10 in	6300	1800
Band Saw	14 in	2500	1100
Bench Grinder	6 in	1720	720
	8 in	3900	1400
	10 in	5200	1600
Air Compressor	1/2 HP	3000	1000
	1 HP	6000	1500
	1-1/2 HP	8200	2200
	2 HP	10500	2800
Electric Chain Saw	1-1/2 HP, 12 in	1100	1100
	2 HP, 14 in	1100	1100
Electric Trimmer	Standard 9 in	350	350
	Heavy Duty 12 in	500	500
Electric Cultivator	1/3 HP	2100	700
Elec. Hedge Trimmer	18 in	400	400
Flood Lights	HID	125	100
	Metal Halide	313	250
	Mercury	1000	
	Sodium	1400	
	Vapor	1250	1000
Submersible Pump	400 gph	600	200
Centrifugal Pump	900 gph	900	500
Floor Polisher	3/4 HP, 16 in	4500	1400
	1 HP, 20 in	6100	1600
High Pressure Washer	1/2 HP	3150	950
	3/4 HP	4500	1400
	1 HP	6100	1600
55 gal Drum Mixer	1/4 HP	1900	700
Wet & Dry Vac	1.7 HP	900	900
	2-1/2 HP	1300	1300

10-8. Power Required To Start Motor



1 Motor Start Code
2 Running Amperage
3 Motor HP
4 Motor Voltage

To find starting amperage:

Step 1: Find code and use table to find kVA/HP. If code is not listed, multiply running amperage by six to find starting amperage.

Step 2: Find Motor HP and Volts.

Step 3: Determine starting amperage (see example).

Welding generator amperage output must be at least twice the motor's running amperage.

Single-Phase Induction Motor Starting Requirements

Motor Start Code	G	H	J	K	L	M	N	P
KVA/HP	6.3	7.1	8.0	9.0	10.0	11.2	12.5	14.0

$$\frac{\textbf{kVA/HP x HP x 1000}}{\textbf{VOLTS}} = \textbf{STARTING AMPERAGE}$$

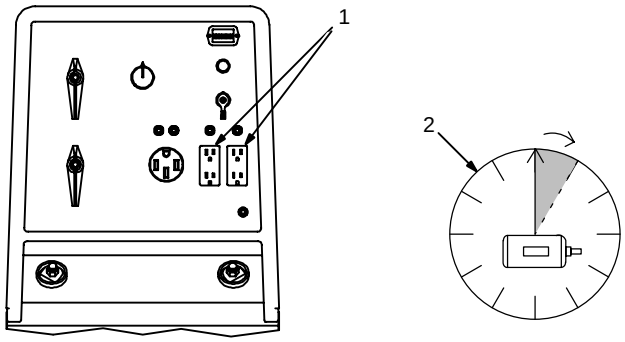
EXAMPLE: Calculate the starting amperage required for a 230 V, 1/4 HP motor with a motor start code of M.

Volts = 230 HP = 1/4 Using Table, Code M results in kVA/HP = 11.2

$$\frac{11.2 \times 1/4 \times 1000}{230} = 12.2\ \text{A}$$ **Starting the motor requires 12.2 amperes.**

S-0624

10-9. How Much Power Can Generator Supply?



1 Limit Load To 90% Of Generator Output

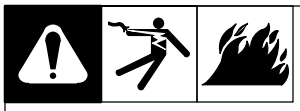
Always start non-resistive (motor) loads in order from largest to smallest, and add resistive loads last.

2 5 Second Rule

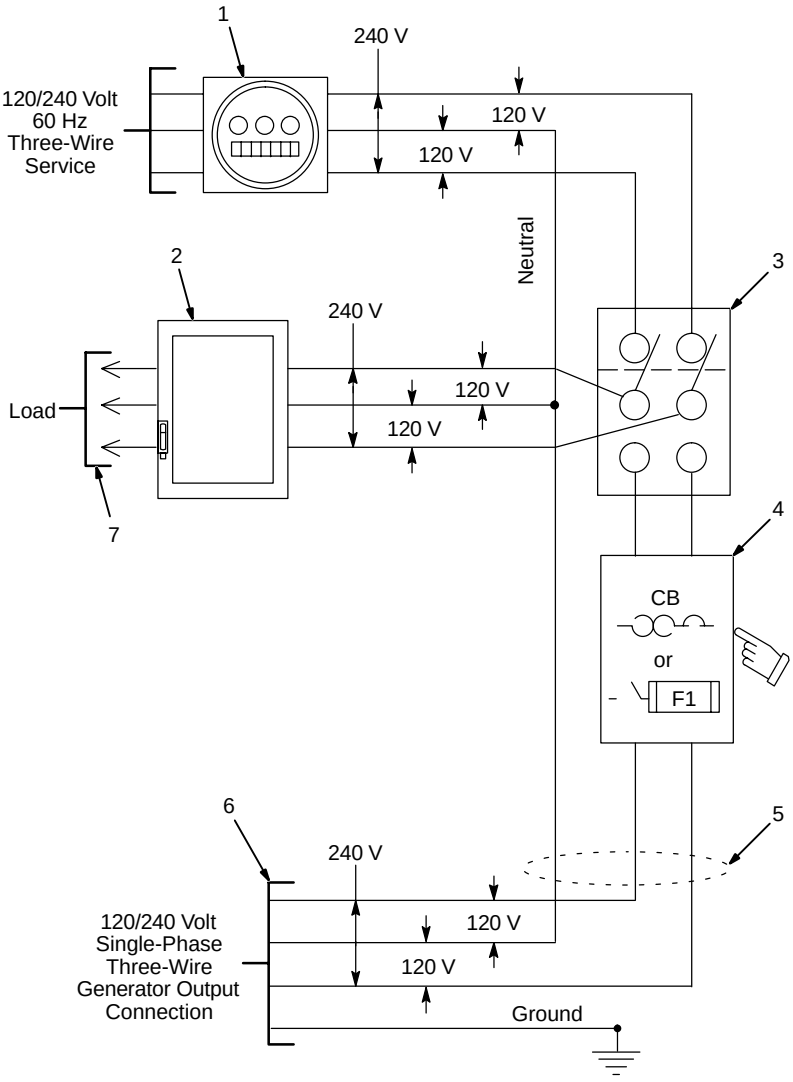
If motor does not start within 5 seconds, turn off power to prevent motor damage. Motor requires more power than generator can supply.

Ref. ST-800 396-A / S-0625

10-10. Typical Connections To Supply Standby Power



☞ *Customer-supplied equipment is required if generator is to supply standby power during emergencies or power outages.*



Item 4 is not necessary if circuit protection is already present in welding generator auxiliary power output circuit.

1 Power Company Service Meter

2 Main and Branch Overcurrent Protection

3 Double-Pole, Double-Throw Transfer Switch

Obtain and install correct switch. Switch rating must be same as or greater than the branch overcurrent protection.

4 Circuit Breakers or Fused Disconnect Switch

Obtain and install correct switch.

5 Extension Cord

Select as shown in Section 10-11.

6 Generator Connections

Connect terminals or plug of adequate amperage capacity to cord. Follow all applicable codes and safety practices.

Turn off or unplug all equipment connected to generator before starting or stopping engine. When starting or stopping, the engine has low speed which causes low voltage and frequency.

7 Load Connections

S-0405-A

10-11. Selecting Extension Cord (Use Shortest Cord Possible)

Cord Lengths for 120 Volt Loads

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	600			350 (106)	225 (68)	137 (42)	100 (30)
7	840		400 (122)	250 (76)	150 (46)	100 (30)	62 (19)
10	1200	400 (122)	275 (84)	175 (53)	112 (34)	62 (19)	50 (15)
15	1800	300 (91)	175 (53)	112 (34)	75 (23)	37 (11)	30 (9)
20	2400	225 (68)	137 (42)	87 (26)	50 (15)	30 (9)	
25	3000	175 (53)	112 (34)	62 (19)	37 (11)		
30	3600	150 (46)	87 (26)	50 (15)	37 (11)		
35	4200	125 (38)	75 (23)	50 (15)			
40	4800	112 (34)	62 (19)	37 (11)			
45	5400	100 (30)	62 (19)				
50	6000	87 (26)	50 (15)				

*Conductor size is based on maximum 2% voltage drop

Cord Lengths for 240 Volt Loads

▲ **If unit does not have GFCI receptacles, use GFCI-protected extension cord.**

Current (Amperes)	Load (Watts)	Maximum Allowable Cord Length in ft (m) for Conductor Size (AWG)*					
		4	6	8	10	12	14
5	1200			700 (213)	450 (137)	225 (84)	200 (61)
7	1680		800 (244)	500 (152)	300 (91)	200 (61)	125 (38)
10	2400	800 (244)	550 (168)	350 (107)	225 (69)	125 (38)	100 (31)
15	3600	600 (183)	350 (107)	225 (69)	150 (46)	75 (23)	60 (18)
20	4800	450 (137)	275 (84)	175 (53)	100 (31)	60 (18)	
25	6000	350 (107)	225 (69)	125 (38)	75 (23)		
30	7000	300 (91)	175 (53)	100 (31)	75 (23)		
35	8400	250 (76)	150 (46)	100 (31)			
40	9600	225 (69)	125 (38)	75 (23)			
45	10,800	200 (61)	125 (38)				
50	12,000	175 (53)	100 (31)				

*Conductor size is based on maximum 2% voltage drop

☞ *Hardware is common and not available unless listed.*

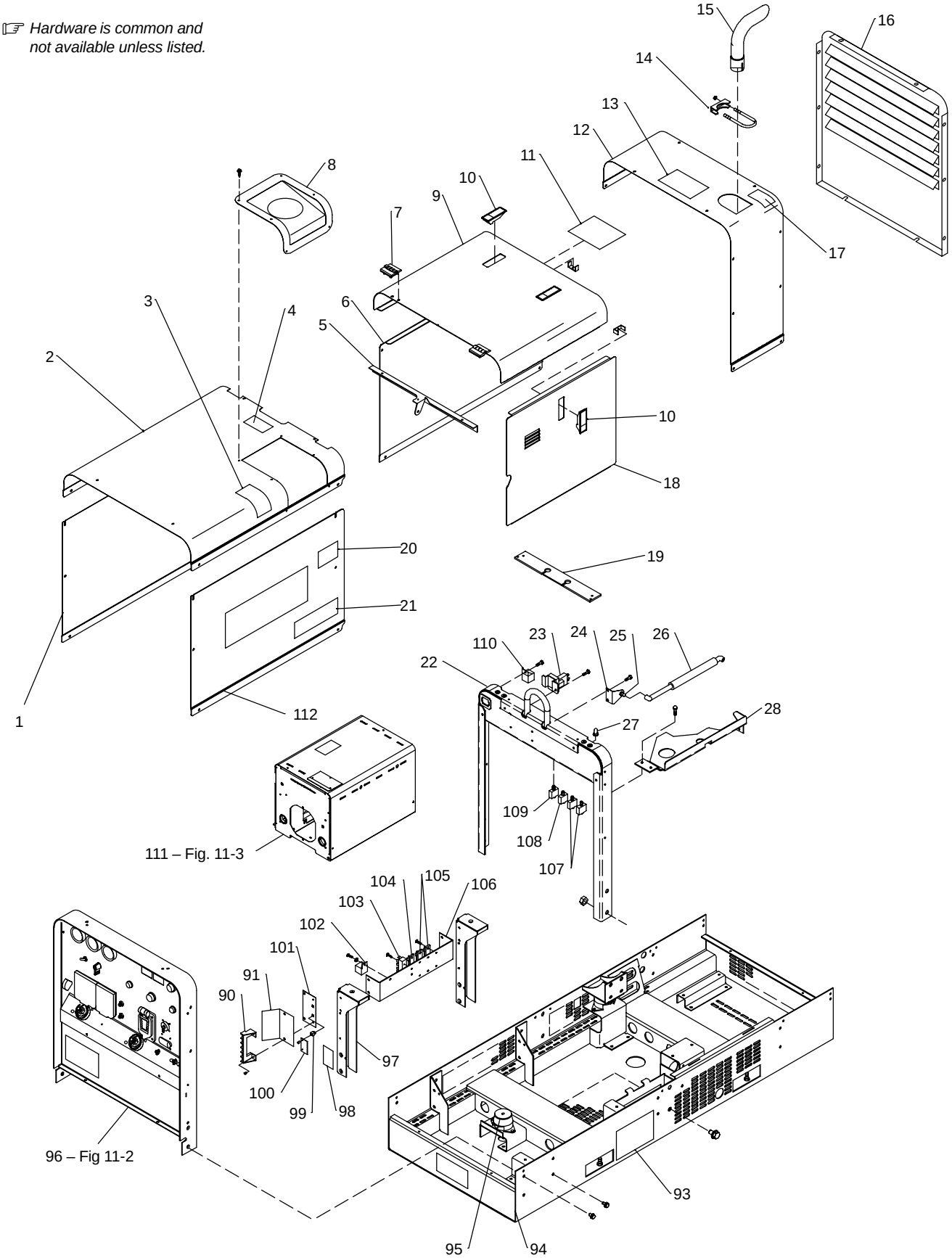
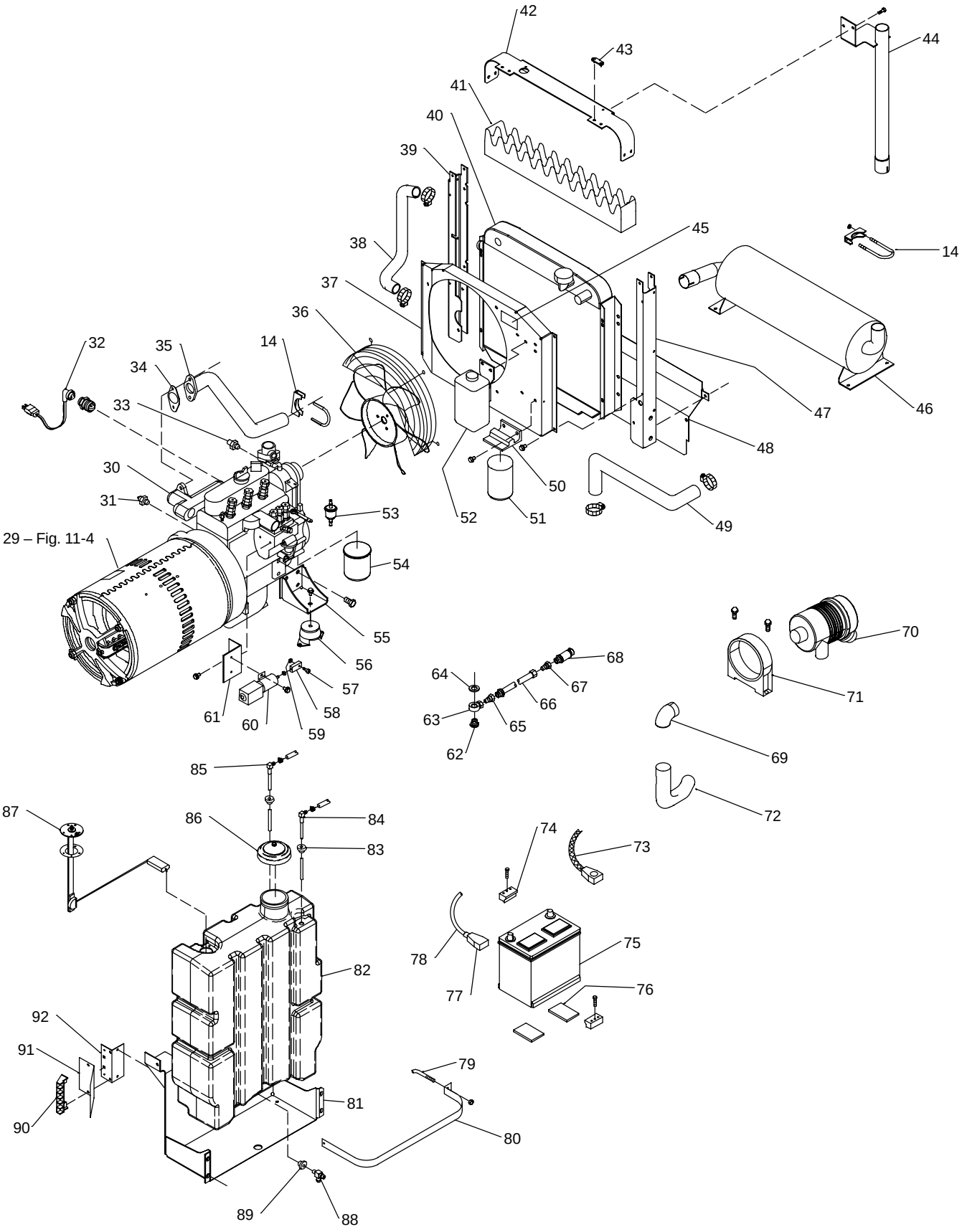


Figure 11-5. Main Assembly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802 324-D

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-5. Main Assembly

1		+198 157	PANEL, generator left	1
2		+198 155	COVER, generator	1
2		+♦198 871	COVER, generator stainless	1
3		107 990	LABEL, use diesel fuel only	1
4		108 487	LABEL, falling equipment	2
5		193 411	BRACE, hood access rear	1
6		198 156	DOOR, access	1
6		♦198 872	DOOR, access stainless	1
7		198 525	HINGE, door access 180deg	2
8		198 159	TRAY, fuel spill	1
9		+198 164	HOOD, access	1
9		+♦198 878	HOOD, access stainless	1
10		194 320	LATCH, door access	3
11		194 295	LABEL, engine maintenance	1
12		198 162	PLENUM, radiator cover	1
12		♦198 875	PLENUM, radiator cover stainless	1
13		200 448	LABEL, warning steam and hot coolant	2
14		109 591	CLAMP, muffler 1.750dia	3
15		192 516	PIPE, exhaust elbow 1.625 OD	1
16		198 153	PANEL, rear	1
17		176 230	LABEL, hot exhaust	1
18		198 154	DOOR, access removable	1
18		♦198 870	DOOR, access removable stainless	1
19		199 019	SEAL, lifitng eye	1
20		090 281	LABEL, caution do not use ether	1
21		168 385	LABEL, warning battery explosion can blind	1
22		198 054	UPRIGHT, base center	1
23	CR2	155 309	CONTACTOR, solenoid 12VDC continuous 400 A	1
24		193 414	BRACKET, mtg gas spring front	1
25		172 296	BALL GAS SPRING, stud .39dia	2
26		192 239	SPRING, pressure gas	1
27		190 323	BOOT, circuit breaker clear hex nut	4
28		197 265	BRACKET, mtg air cleaner and stop door access	1
29		Figure 11-8	GENERATOR ASSEMBLY	1
30		193 624	ENGINE, Kubota dsl elec (consisting of)	1
31	S2		SWITCH, oil pressure (included w/engine)	1
32		200 653	HEATER, block engine 120v 400w kabota 905	1
33	S3	192 190	SWITCH, thermo temp 230deg ±5deg F NO	1
34		192 517	GASKET, exhaust manifold	1
35		192 194	PIPE, exhaust flexible inlet	1
36		191 693	GUARD, fan	1
37		+198 937	SHROUD, fan	1
38		191 341	HOSE, radiator outlet	1
39		198 186	BRACKET, mtg radiator LH	1
40		197 822	RADIATOR, w/14# cap 3 row core 1.125 inlet/outlet	1
41		194 578	BAFFLE, air foam	1
42		198 181	RADIATOR ARCH	1
43		191 626	BUMPER, door access	2
44		192 195	PIPE, exhaust outlet	1
45		147 923	LABEL, warning moving parts	2
46		192 192	MUFFLER, exhaust	1
47		198 187	BRACKET, mtg radiator RH	1
48		198 185	BAFFLE, lower radiator	1
49		191 342	HOSE, radiator inlet	1
50		191 515	BASE, fuel filter	1
51		*192 744	FILTER, fuel spin-on	1
52		187 462	BOTTLE, overflow w/cap and hose	1
		192 934	BRACKET, mtg coolant recovery tank	1
53		*066 113	FILTER, fuel inline .250	1
54		*196 428	FILTER, oil	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-5. Main Assembly (Continued)

. . 55		192 475	. . SUPPORT, engine	2
. . 56		192 476	. . MOUNT, engine vibration	2
. . 57		118 829	. . SCREW, shld stl sch .312-18 x .500 x .375	1
. . 58		194 127	. . LINKAGE, throttle solenoid	1
. . 59		145 675	. . NUT, .312-18 x .50 hex .37h stl pld deformed	1
. . 60		192 196	. . SOLENOID, 12VDC 46A push/hold (throttle)	1
. . 61		192 663	. . BRACKET, mtg solenoid	1
. . 62		047 234	. . BOLT, banjo	1
. . 63		047 236	. . FITTING, banjo	1
. . 64		047 235	. . WASHER, seal oil copper .879 ID x 1.059 OD	1
. . 65		047 362	. . FITTING, pipe stl adapter spl	1
. . 66		008 114	. . HOSE, oil w/fittings 17.500 long	1
. . 67		047 231	. . FITTING, pipe stl adapter swvl 1/2 x 1/2	1
. . 68		165 271	. . VALVE, oil drain 3/8-18 NPTF	1
. . 69		197 256	. . HOSE, elbow air cleaner	1
. . 70		192 188	. . AIR CLEANER, intake 90deg outlet 4.25 in dia	1
		*187 441	. . ELEMENT, air cleaner	1
. . 71		193 026	. . BAND, mtg air cleaner case	1
. . 72		197 227	. . HOSE, elbow air intake	1
. . 73		032 453	. . CABLE, bat neg 24.375 No. 2 awg w/clamp and .375 rng	1
. . 74		182 935	. . HOLD DOWN, battery	2
. . 75		146 237	. . BATTERY, stor 12V 535crk 90rsv gp 55	1
. . 76		147 988	. . STRIP, rbr adh back .125 x 1.000 x 4.000 60 duro	2
. . 77		114 923	. . BOOT, insulator term post red 1/0 cable .875 OD x 1.00	2
. . 78		182 276	. . CABLE, bat pos 28.000 No. 1 awg w/clamp and .406 lug	1
		108 081	. . TERMINAL PROTECTOR, battery post mtg	2
. . 79		097829	. . Bolt, J Stl .250–20 X 2.750 Pld	1
. . 80		192 115	. . Strap, Fuel Tank	1
. . 81		198 168	. . Support, Fuel Tank/Weld Components	1
. . 82		198 180	. . Tank, Fuel 13.1 Gal (Consisting Of)	1
. . 83		124 253	. . . . Bushing, Tank Fuel	2
. . 84		198 510	. . . . Ftg, Stand Pipe Hose .3125 X24.570lg 90 Deg Zinc	1
. . 85		198 511	. . . . Ftg, Stand Pipe Hose .1875x24.570lg 90 Deg Zinc	1
. . 86		190 198	. . . . Cap, Tank Screw–on 3.500 In W/Vent	1
. . 87		198 512	. . . . Sender, Fuel Gauge 22.500 Deep Tank	1
. . 88		189 908	. . . . Valve, Drain Fuel 180 Deg Zinc Pld	1
. . 89		181 572	. . . . Bushing, Tank Fuel	1
. . 90		172 661	. . BLOCK, stud connection 6posn	2
. . 91		196 180	. . INSULATOR, terminal block	2
. . 92		201 182	. . BRACKET, terminal strip	1
. . 93		197 930	. . LABEL, warning do not weld on base	2
. . 94		197 835	. . BASE	1
. . 95		192 477	. . MOUNT, engine vibration	1
. . 96		Figure 11-6	. . FRONT PANEL ASSEMBLY	1
. . 97		198 167	. . SUPPORT, inverter chassis	2
. . 98		190 861	. . LABEL, electric shock and moving parts	1
. . 99		141 690	. . GROMMET, SCR No. 8/10 panel hole .281sq .187 high	4
. 100 . .	PC7	181 261	. . CIRCUIT CARD ASSEMBLY, filter HF	1
. 101		191 739	. . PLATE, mtg components	1
		197 245	. . HARNESS, wiring interconnecting (consisting of)	1
. 102 . .	CR1	173 069	. . . . RELAY, encl 12VDC SPDT 30A/20A 5 pin flange mtg	1
. 103		197 147	. . . . BLOCK, term 5-4-3	1
. 104 . . .	D3	135 184	. . . . DIODE BOARD	1
. 105 .	D4,D5	128 299	. . . . DIODE BOARD	2
. 106		191 735	. . . . STRIP, mtg components	1
. . . . .	PLG11	148 850	. . . . SOCKET, relay 5 pin	1
. . . . .	PLG24	135 275	. . . . CONNECTOR, rect univ 084 15P/S 3 row plug (service kit)	1
. . . . .	PLG15	166 680	. . . . CONNECTOR, rect univ 084 12P/S 3 row plug (service kit)	1
. . . . .	PLG35	177 859	. . . . CONNECTOR, body 5 terminal	1
. . . .	PLG33,PLG34	153 501	. . . . CONNECTOR, rect univ 039 6P/S 3 row plug (service kit)	2
. . . . .	S4	108 024	. . . . SWITCH, tgl DPST MC 15A 125VAC friction term	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-5. Main Assembly (Continued)

. . . . .		197 535	. . HARNESS, wiring engine compartment (consisting of)	1
. . . . .	RC15	158 466	. . . . CONNECTOR, rect univ 084 12P/S 3 row rcpt	1
. . . . .	PLG27	192 170	. . . . CONNECTOR, rect 250 2skt 1 row plug	1
. . . . .	PLG36	192 169	. . . . CONNECTOR, rect 250 1skt 1 row plug	1
. . . . .	PLG28	192 171	. . . . CONNECTOR, rect 250 3skt 1 row plug	1
. . . . .	PLG37	192 168	. . . . CONNECTOR, rect 250 1 pin 1 row rcpt	1
. . . . .	PLG11	092 670	. . . . CONNECTOR, rect univ 084 3P/S 1 row plug	1
. . . . .		192 167	. . . . SEAL, wire univ 3P/S 1 row	1
. 107	CB9,CB10	139 266	. . . . CIRCUIT BREAKER, man reset 1P 15A 250VAC frict (see Figure 11-5)	2
. 108	CB8	115 427	. . . . CIRCUIT BREAKER, man reset 1P 25A 250VAC frict (see Figure 11-5)	1
. 109	CB7	147 658	. . . . CIRCUIT BREAKER, man rest 1P 30A 250VAC screw (see Figure 11-5)	1
. 110	CR3	197 325	. . . . RELAY, encl 12vdc spst 50a 4pin flange mtg	1
. . 111	. . . . .	Figure 11-7	. . INVERTER ASSEMBLY	1
. 112	. . . . .	198 158	. . PANEL, generator right	1
. . . . .		194 126	. . KIT, foam	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.

♦Optional

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

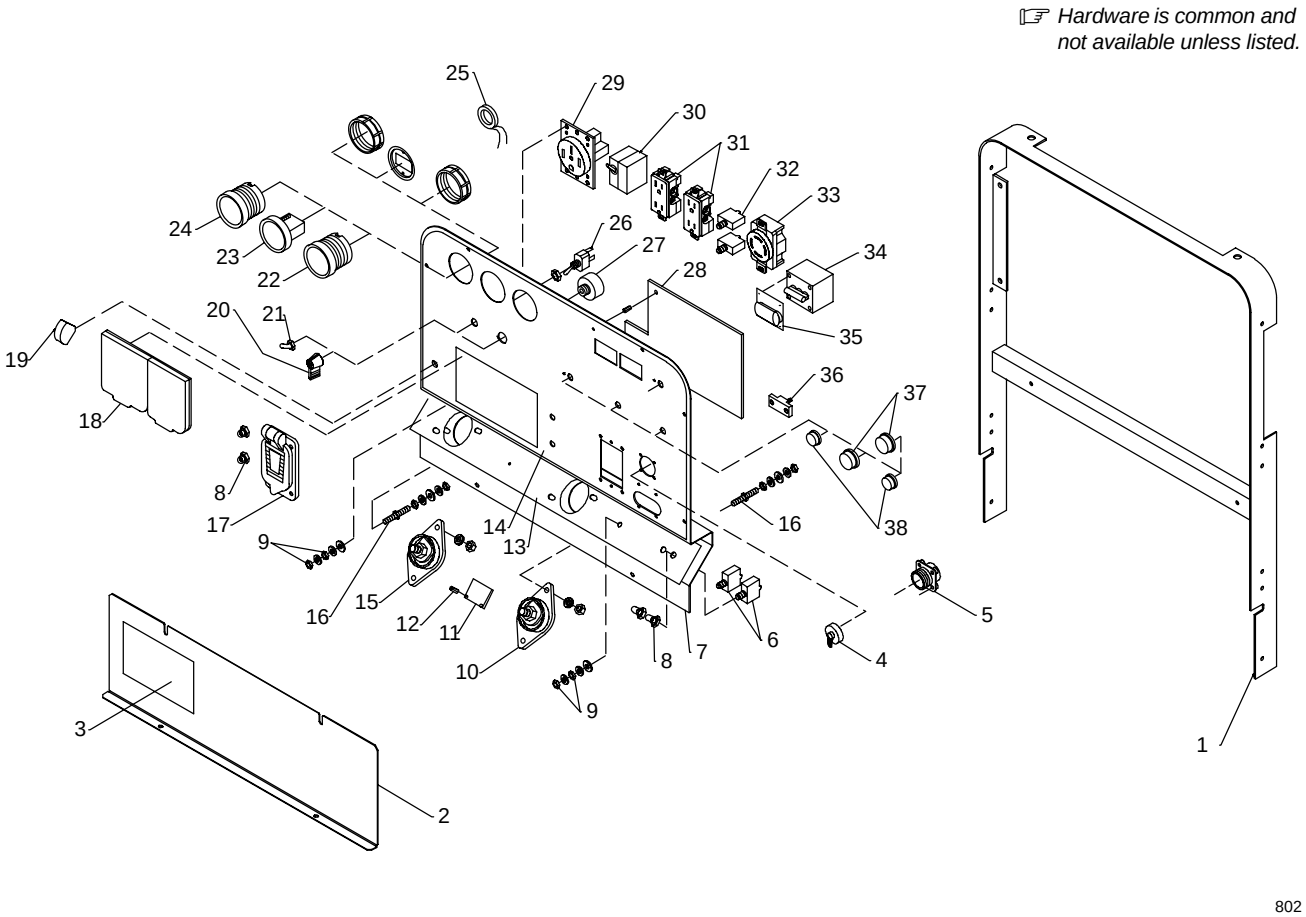


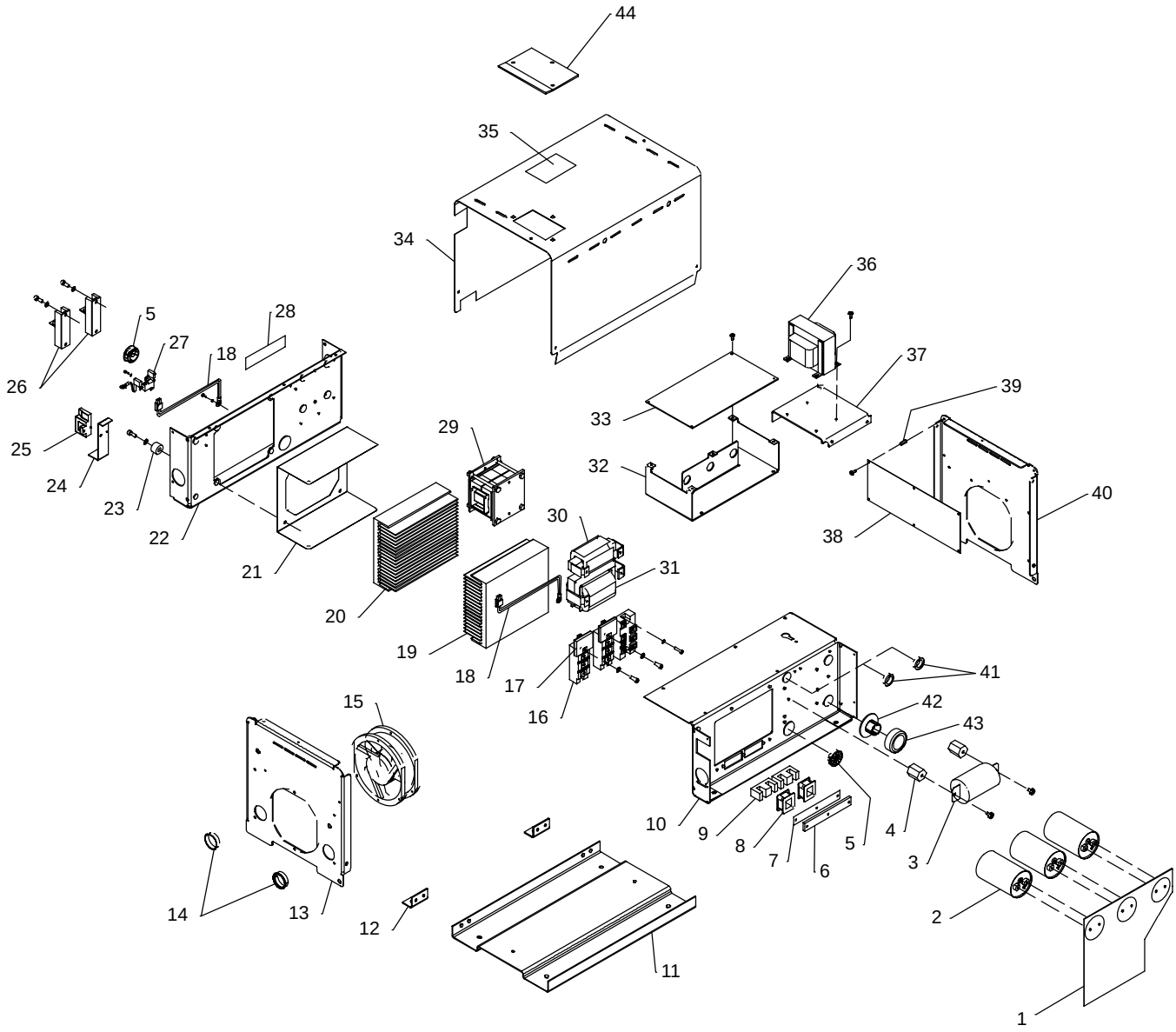
Figure 11-6. Front Panel

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 11-6. Front Panel (Figure 11-5, Item 96)	
1		198 049	UPRIGHT, base front	1
2		+191 737	PANEL, front louver	1
3		182 761	LABEL, warning general precautionary CSA	1
4		170 391	CONN, circ ms protective cap	1
		189 383	RECEPTACLE/CIRCUIT BREAKERS with leads (consisting of)	1
5	RC5	143 976	CONNECTOR, circ MS/CPC 14skt sz 20 rcpt panel push-in (service kit)	1
	PLG13	115 091	CONNECTOR, rect mini 045 10skt 2 row plug (service kit)	1
6	CB11,CB12	083 432	CIRCUIT BREAKER, man reset 1P 10A 250VAC frict	2
7		200 380	PANEL, front	1
8		190 323	BOOT, circuit breaker clear hex nut	2
9		601 836	NUT, 250-20 .50hex .19H brs	8
10		039 046	TERMINAL, pwr output black	1
11	PC5	148 608	CIRCUIT CARD ASSEMBLY, filter HF	1
12		097 132	STAND-OFF, No. 6-32 x .375 lg .250hex brs	2
13			PLATE, lower (order by model & serial number)	1
14			NAMEPLATE, upper (order by model & serial number)	1
15		039 047	TERMINAL, pwr output red	1
16		083 030	STUD, brs .250-20 x 1.750 w/hex collar	2
17		086 861	COVER, receptacle weatherproof	1
18		188 039	COVER, receptacle w/gasket	2
19		200 930	BOOT, circuit breaker 1 pole	1
20		119 014	LEVER, switch black	1
21		021 385	BOOT, tgl switch lever	1
22		192 265	GAUGE, fuel elec switch w/o switchgage sensor	1
23		118 058	METER, hour 12-24VDC 2.25dia	1
24	PL1	191 935	LED, red 12.0V 4 ind lights spl panel mtg round	1
25	CT2	192 237	TRANSFORMER, current	1
26	S4	108 024	SWITCH, tgl DPST mc 15A 125VAC friction	1
27	S1	176 606	SWITCH, ignition 4posn w/o handle	1
28	PC3	196 156	CIRCUIT CARD ASSEMBLY, front panel	1
29	RC3	182 954	RECEPTACLE, str 3P4W 50A 125/250V	1
30	CB3	200 929	CIRCUIT BREAKER, man reset 2p 50a 240vac screw–90	1
31	RC1,RC2	192 500	RECEPTACLE, str dx grd 2P3W 20A 125V	2
32	CB1,CB2	093 996	CIRCUIT BREAKER, man reset 1P 20A 250VAC frict	2
33	RC6	007 469	RECEPTACLE, twlk grd 3P4W 30A 250V	1
34	CB13	192 565	CIRCUIT BREAKER, man reset 3P 30A 250VAC	1
35		192 566	BOOT, circuit breaker 3 pole	1
36		072 253	STUD, connection single 10-32 x .500 x 1.250mtg	1
37		174 991	KNOB, pointer 1.250dia x .250 ID w/spring clip	2
38		174 992	KNOB, pointer .820dia x .250 ID w/spring clip	2

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*



802 326-A

Figure 11-7. Inverter Assembly

Item No.	Dia. Mkgs.	Part No.	Description	Quantity

Figure 11-7. Inverter Assembly (Figure 11-5, Item 111)

1	PC2	196 148	CIRCUIT CARD ASSEMBLY, interconnecting	1
2	C3,C4,C5	174 980	CAPACITOR, elctlt 2700uf 420	3
3	C1	186 015	CAPACITOR, polyp film .34uf	1
4		025 248	STAND-OFF, insul .250-20 x 1.2	2
5		179 276	BUSHING, snap-in nyl 1.000	1
6		175 140	BRACKET, DI/DT	1
7		181 197	GASKET, DI/DT rubber	1
8	L3,L4	175 482	COIL, DI/DT	2
9		109 056	CORE, ferrite E 2.164 lg x 1.09	2
10		185 731	WINDTUNNEL, RH	1
11		189 755	BASE	1
12		191 568	FOOT, mtg unit	2
13		200 649	PANEL, front	1
14		170 647	BUSHING, snap-in 1.312 ID	2
15		175 084	MOTOR, fan 24VDC 3000RPM	1
16	SR1	179 629	KIT, diode power module	1
17	PM1,PM2	180 110	KIT, transistor IGBT module	2
18	RT1,RT2	173 632	THERMISTOR, NTC 30K ohm at 25D C	2
19		173 631	HEAT SINK, power module	1
20		175 192	HEAT SINK, rect	1
21		175 255	INSULATOR, rectifier	1
22		+183 551	WINDTUNNEL, LH	1
23		181 853	INSULATOR, screw	4
24		189 421	BRACKET, mtg LEM	1
25	HD1	189 567	TRANSDUCER, current 400A	1
26	D1,D2	179 630	KIT, diode ultra-fast recovery	2
27	R1,C6,C7	175 194	RESISTOR/CAPACITOR	1
28		185 835	LABEL, warning electric shock	2
29	T1	173 811	TRANSFORMER, HF 230/460	1
30	L1	173 563	INDUCTOR, input	1
31	Z1	189 525	STABILIZER, output	1
32		189 420	BRACKET, mtg capacitor/PC board	1
33	PC1	185 749	CIRCUIT CARD ASSEMBLY, control	1
34		+200 650	WRAPPER, inverter chassis	1
35		190 861	LABEL, electric shock and moving parts	1
36	T2	189 481	TRANSFORMER, control 300VA 230VAC pri	1
37		189 422	BRACKET, mtg transformer control	1
38	PC8	196 152	CIRCUIT CARD ASSEMBLY, voltage	1
39		115 440	STAND-OFF, No. 6-32 x .687 lg	5
40		200 651	PANEL, rear	1
41		153 403	BUSHING, snap-in nyl .750 ID	2
42		177 547	BUSHING, snap-in nyl ct-mount	1
43	CT1	175 199	TRANSFORMER, current	1
		189 607	HARNESS, wiring unit (consisting of)	1
	PLG22	115 094	CONNECTOR, rect mini 045 4skt 2 row plug (service kit)	1
	RC10	168 071	CONNECTOR, rect univ 084 9P/S 3 row rcpt (service kit)	1
	PLG2	115 091	CONNECTOR, rect mini 045 10skt 2 row plug (service kit)	1
	PLG23	130 203	CONNECTOR, rect mini 045 12 skt 2 row plug (service kit)	1
	RC24	047 483	CONNECTOR, rect univ 084 15P/S 3 row rcpt (service kit)	1
	PLG9	183 046	CABLE, LEM	1
44		200 590	COVER, ribbon access	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.
*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

☞ *Hardware is common and not available unless listed.*

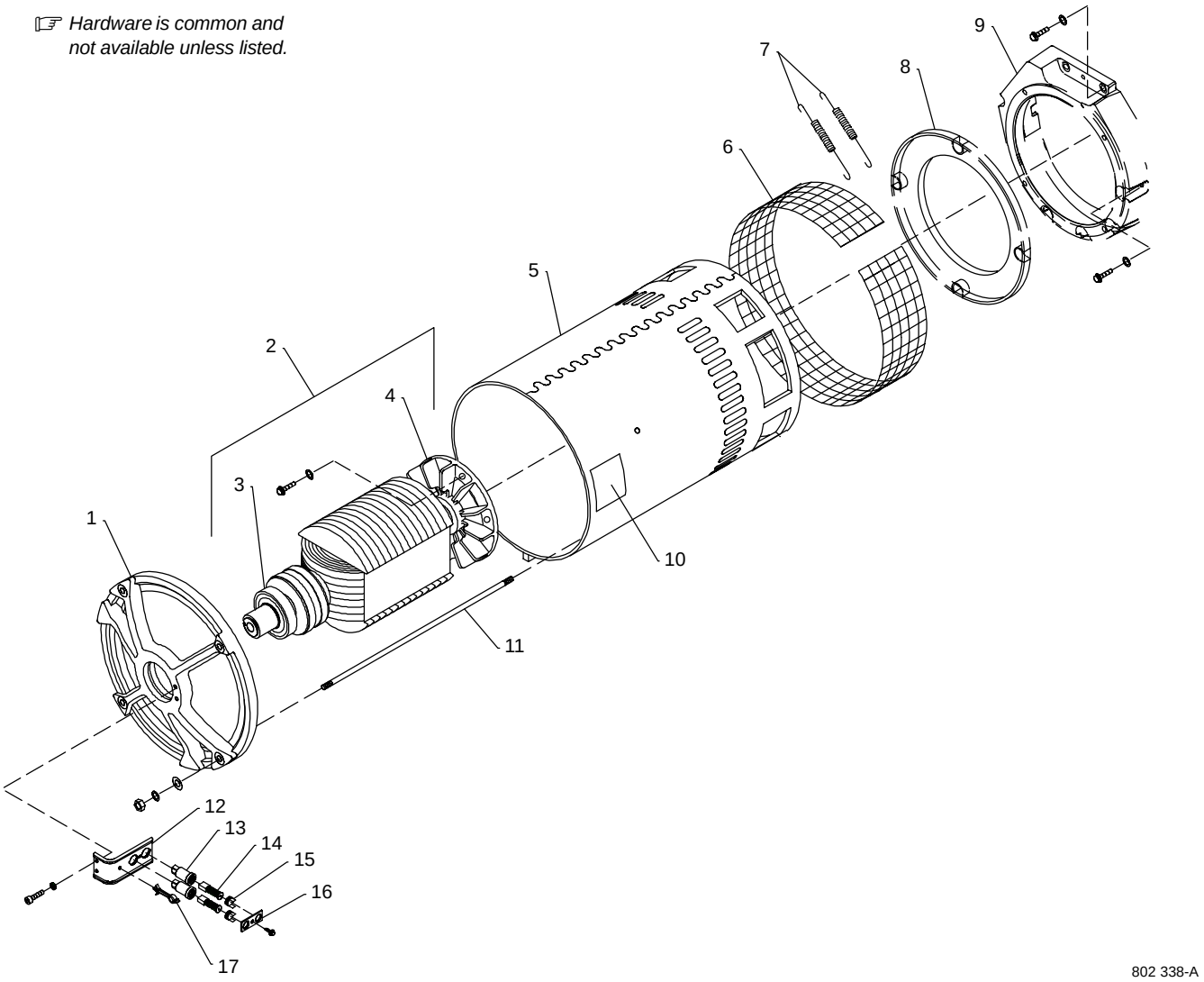


Figure 11-8. Generator

Item No.	Dia. Mkgs.	Part No.	Description	Quantity
			Figure 11-8. Generator Assembly (Figure 11-5, Item 29)	
1		160 943	ENDBELL	1
2		192 581	ROTOR, generator (consisting of)	1
3		053 390	.... BEARING, ball rdl sgl row 1.370 x 2.830 x .6	1
4		192 600	.... FAN, rotor gen	1
5		+189 480	STATOR, generator	1
6		172 656	GUARD, generator wire mesh	1
7		172 674	SPRING, ext .240 OD x .041 wire x 3.500pld	2
8		159 918	BAFFLE, fan	1
9		193 515	ADAPTER, engine	1
10		013 367	LABEL, warning moving parts	2
11		170 861	STUD, stl .375-16 x 17.375	4
12		125 548	HOLDER, brush elect	1
13		005 614	HOLDER, brush	2
14		*126 984	BRUSH, w/spring	2
15		161 306	CAP, brushholder	2
16		047 879	BAR, retaining brushholder	1
17		165 664	CLIP, wire stdf .350 bundle .187hole .078–.156 thk	1

+When ordering a component originally displaying a precautionary label, the label should also be ordered.

*Recommended Spare Parts.

To maintain the factory original performance of your equipment, use only Manufacturer's Suggested Replacement Parts. Model and serial number required when ordering parts from your local distributor.

Warranty Questions?

Call
1-877-HOBART1
for your local
Hobart distributor.

Service
You always get the fast, reliable response you need. Most replacement parts can be in your hands in 24 hours.

Support
Need fast answers to the tough welding questions? Contact your distributor or call 1-800-332-3281. The expertise of the distributor and Hobart is there to help you, every step of the way.

HOBART WELDERS

HOBART WARRANTY

Effective January 1, 2000
(Equipment with a serial number preface of "LA" or newer)

This limited warranty supersedes all previous Hobart warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Hobart Welding Products., Troy, Ohio, warrants to its original retail purchaser that new Hobart equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Hobart. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Hobart will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Hobart must be notified in writing within thirty (30) days of such defect or failure, at which time Hobart will provide instructions on the warranty claim procedures to be followed.

Hobart shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor
   * DS-2 Wire Feeder
   * Motor Driven Guns (w/exception of Spoolmate 185 & Spoolmate 250)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Maxstar 140
   * Spot Welders
   * Load Banks
   * Hobart Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT & SAF Models)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts
   * MIG Guns/TIG Torches
   * Induction Heating Coils and Blankets
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate 185 & Spoolmate 250
   * Canvas Covers

HOBART's Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Hobart, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Hobart, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

HOBART PRODUCTS ARE INTENDED FOR PURCHASE AND USE BY COMMERCIAL/INDUSTRIAL USERS AND PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT.

In the event of a warranty claim covered by this warranty, the exclusive remedies shall be, at Hobart's option: (1) repair; or (2) replacement; or, where authorized in writing by Hobart in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Hobart service station; or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at customer's risk and expense. Hobart's option of repair or replacement will be F.O.B., Factory at Appleton, Wisconsin, or F.O.B. at a Hobart authorized service facility as determined by Hobart. Therefore no compensation or reimbursement for transportation costs of any kind will be allowed.

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Please complete and retain with your personal records.

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Purchase Date (Date which equipment was delivered to original customer.)

Distributor

Address

City

State Zip

Resources Available

Always provide Model Name and Serial/Style Number.

To locate a Distributor, retail or service location:

Call 1-877-Hobart1 or visit our website at www.HobartWelders.com

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Call 1-800-332-3281

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Contact the Delivering Carrier for:

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File a claim for loss or damage during shipment.

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